

# **Enterprise Applications Service Technologies (EAST)**

## **Attachment L-B Background and Historical**

**May 13, 2009**

## Attachment L-B - Background and Historical

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## **Enterprise Applications Service Technologies (EAST) Attachment L-B - Background and Historical**

### **1 NASA ENTERPRISE APPLICATIONS COMPETENCY CENTER (NEACC) BACKGROUND**

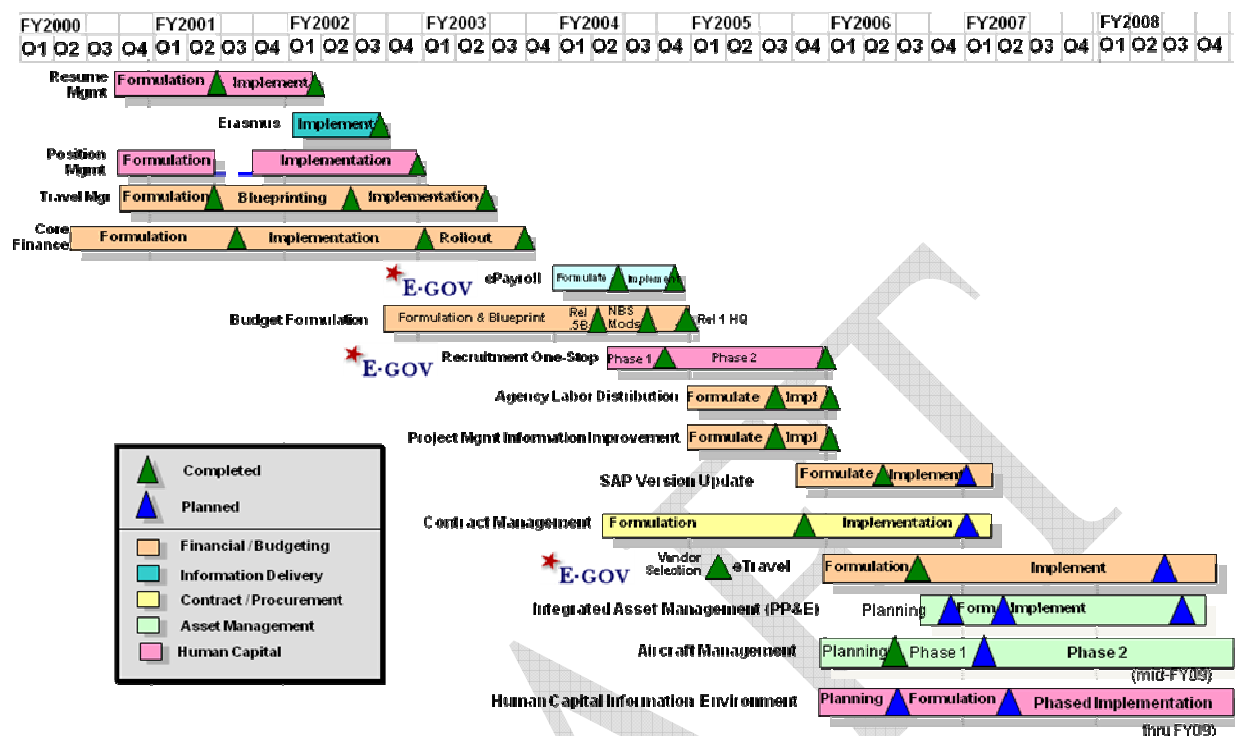
#### **1.1 Introduction**

The NASA Enterprise Applications Competency Center (NEACC) is responsible for implementing, operating, and maintaining a broad spectrum of NASA's Enterprise Applications, as well as for supporting the extended Enterprise Applications stakeholder and End User communities. The NEACC was established in 2002 in conjunction with the implementation of the Core Financial System—NASA's first integrated, Agency wide Financial Management application deployed under the Integrated Enterprise Management Program (IEMP). In establishing the NEACC, key components of Gartner's Competency Center model were adopted; namely the emphasis on fully integrating business process expertise with application and technical know-how. As a result, the NEACC is comprised of multiple Delivery Functions that encompass business process functional support, application development and quality assurance, and application and technical operation functions.

The NEACC continues to be engaged in both sustaining operations activities as well as in the implementation of new applications and capabilities (See Historical Timeline below). With the scheduled conclusion of IEMP at the close of 2009, the NEACC completes the rollout of systems and capabilities scheduled for deployment as part of the IEM Program.

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## Historical Timeline



With the completion of the IEM Program, the NEACC continues to transition to a service organization aligned with the Information Technology (IT) Infrastructure Integration Program (I<sup>3</sup>P) managed out of the Agency Office of Chief Information Officer (OCIO). The MSFC OCIO retains oversight and input into the activities of the NEACC, while the Agency OCIO manages the portfolio and sets the general direction for the applications and platforms to be included in the NEACC scope. With the transition from the UNITEs to the EAST contract, some applications and platforms that were not previously included in NEACC scope have been added. As the Agency continues to refine its Enterprise Architecture strategy and supporting services and portfolios, the NEACC may experience additional changes in scope throughout the life of the EAST contract.

The NEACC is currently located off-site from the Marshall Space Flight Center (MSFC) at 296 Cochran Road, Huntsville, Alabama. The Government leased facility, comprised of three interconnecting buildings, provides approximately 175,000 square feet of office space and houses the entire NEACC civil service and contractor workforce.

This Background and Historical section seeks to provide an overview of the current state of the NEACC, including: organizational structure, service offerings, processes, key technologies, and historical data. The information in this section—and in supporting reference documents located on the EAST I<sup>3</sup>P website: [http://ec.msfc.nasa.gov/apt/portal\\_acqDetails.php?acqNum=2](http://ec.msfc.nasa.gov/apt/portal_acqDetails.php?acqNum=2) is offered to facilitate a further understanding of the NEACC's current scope and historical context, as well as opportunities and challenges. It does not, however, necessarily reflect the future

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direction, requirements, or improvements sought in conjunction with the EAST contract. The Performance Work Statement in Attachment **J-1** and Attachment **J-1**, Appendix **A** should therefore be considered the sole reference for requirements associated with the EAST contract. With the transition to the I<sup>3</sup>P multi-sourcing approach for Agency IT services, the NEACC will be dependent on other I<sup>3</sup>P contracts and providers for many of the core services required to operate the NEACC factory. This document also attempts to describe those touch-points and the resulting dependencies.

## **1.2 Government Retained Authorities**

### **1.2.1 NASA Enterprise Applications Competency Center (NEACC) Management**

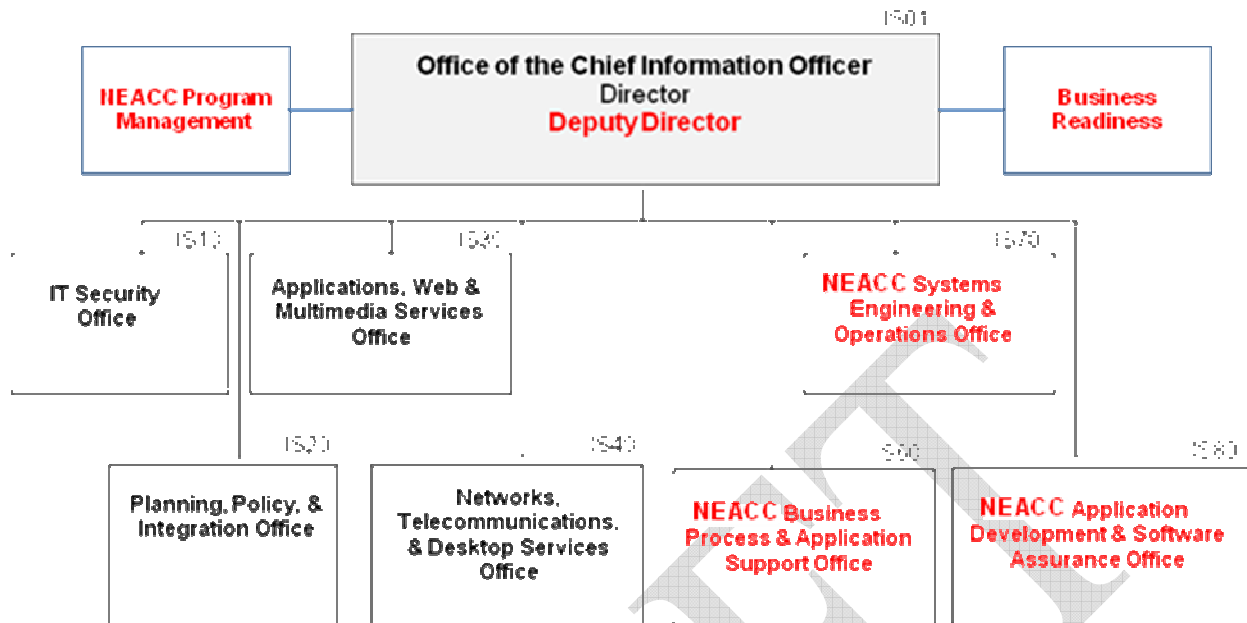
#### **1.2.1.1 NEACC Organizational Structure**

The current organizational structure of the NEACC does not necessarily reflect the future structure of the NEACC under the EAST contract.

The NEACC is managed out of the MSFC Office of Chief Information Officer (OCIO). During the continued execution of the IEM Program, the NEACC was aligned with the IEM Program Office under the Agency Office of the Chief Information Officer. With the completion of IEMP and the subsequent retirement of the IEM Program, the NEACC became aligned with the Business IT Systems Portfolio managed out of the Agency Office of the Chief Information Officer. The Agency OCIO Business IT Systems Portfolio Manager acts as the overall Program Executive for the NEACC and for the systems managed within the NEACC scope.

The NEACC Director, assigned as MSFC OCIO Deputy Director within the IS01 organization, has overall responsibility and accountability for all NEACC operations. The areas of NEACC Program Management and Business Readiness (Corporate Change Management) are included within IS01. IS60, with the largest number of civil servants, is responsible for providing Business Process Support and Application Operations functions. IS70 is responsible for delivering all Systems Engineering and Operations services required by the NEACC, including functions currently provided by the NASA Data Center (NDC) located at MSFC. IS80 is responsible for delivering Application Development services and Quality Assurance functions.

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In the current NEACC organizational model, the Government is responsible and accountable for efficiently managing the NEACC and for achieving the service levels established with its stakeholder communities. While the EAST model will shift more responsibility to the Contractor for operating the NEACC factory and ensuring that service levels are attained, the NEACC Director retains overall accountability for the NEACC management and operations.

### 1.2.1.2 Governance Processes

The Enterprise Applications managed by the NEACC are dynamic and require periodic updates and enhancements to ensure that they maintain relevancy and continue to address the needs of a broad user community. These updates are coordinated as part of the NEACC Governance process, which ultimately feeds into the NEACC Release Management activities. The current NEACC Governance Process provides a Demand Management capability that ensures incoming requests are evaluated, prioritized, and appropriately sequenced for delivery.

The NEACC Governance process currently consists of a tiered approach. The current Governance tiers, listed from the top down, are:

- Operations Management Council (OMC)
  - The OMC is the highest level Governance entities for Agency Business Systems and is comprised of representatives from Agency leadership. The OMC reviews recommendations from other groups and sets the direction for overall Agency Business System strategy.

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- **Management / Business Systems Integration Group (M/BSIG)**
  - The M/BSIG is comprised of Management representatives from across a broad range of Mission and Mission Support domains. The M/BSIG is an advisory group responsible for assessing and recommending an integrated set of Agency-wide Business System requirements and priorities. The M/BSIG membership is comprised entirely of Government personnel.
  - The M/BSIG evaluates Enterprise Applications change or enhancement requests at a high level and makes recommendations to the OMC concerning near-term and long-term priorities for the Agency's Enterprise Applications roadmap.
- **Functional Control Board (FCB)**
  - The FCB is a working group responsible for managing and prioritizing all Applications Enhancement change requests for a specific functional Line of Business (e.g., Logistics, Financial, and Human Capital & Workforce). Each FCB is led by the Agency Business Process Lead for a specific Line of Business. The FCB membership is comprised of Government personnel who represent Business or Subject Matter Experts (SMEs) from across the NASA centers.
- **NEACC Release Review Board (RRB)**
  - The RRB is responsible for establishing the release content for NEACC-managed releases. The RRB is comprised of Civil Servant personnel from within the NEACC, who represent the view and priorities established by their respective FCB. The RRB membership is comprised of both Government and Contractor personnel assigned to the NEACC.

### **1.2.2 Demand Management**

NEACC Management is responsible for the overall Demand Management functions associated with the NEACC. Demand Management functions include coordinating all aspects of the Enterprise Applications Governance process, scheduling and facilitating Functional Control Board and Release Review Board sessions, assisting NEACC stakeholders with the prioritization and approval of incoming requests, and collaborating closely with the UNITEs Contractor to ensure that available NEACC factory capacity is effectively utilized to address demand based on business priorities.

### **1.2.3 Business Process Support**

Since its establishment, the Government has provided the knowledge required to ensure that Enterprise Applications are appropriately configured to support the Agency's business processes and procedures. In addition, the NEACC Government staff has amassed a broad range of functional and technical expertise around the applications managed within the Lines of Business. The Business Process Support (BPS) team provides an oversight function in ensuring that all



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changes to applications adhere to appropriate levels of approval, and that all potential system and business process impacts are addressed.

Following the shift to the EAST contract, the Government plans to retain authority and control of Business Process Support functions as described below.

NASA Lines of Business Support:

The BPS team serves as a liaison with the various Agency, and Center, stakeholders in each line of business supported by the NEACC.

The tasks listed below are inherently governmental and will be retained by the BPS team in each line of business:

- Ensure adherence to, and consistency of, Agency Design on all new change requests (Regulatory, Policy, User Enhancement)
  - Analysis of impact to Agency Design
  - Recommend approach and timeline for implementation
  - Identify necessary test scenarios and expected test results
  - Sign-off of test results prior to implementation
- Consultation with Application Functional Support team, as needed, regarding Applications Maintenance support
- Liaison for identification of fiscal year end close/start up business processes and identification of new fiscal year start up requirements
- Integration of new projects/activities
- Source of staffing for new projects, including major upgrades
- Provide FCB support to the Agency
- BPS lead serves as a voting member on the NEACC RRB
- Continuous process improvement
- User enrichment
- Communication

SAP Application Technical Support (ATS):**Configuration**

The SAP ATS Team is responsible for those areas of SAP configuration that are not isolated to a particular module or transaction. These areas of SAP configuration require specific cross-functional system knowledge to ensure that the correct change is made, and that unintended impacts to other areas or processes are prevented. The Application Functional Support teams finalize requirements and ATS is responsible for completing the configuration according to the

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release schedule for the applicable service request. ATS is responsible for unit testing the configuration by performing the necessary transaction that will test the change. Once the change has been successfully unit tested the ATS team communicates the change and the level of testing required to the Application Functional Support team. The ATS team member responsible for the configuration ensures that an object migration form is created, is placed in the appropriate status for migration, and ensures that all appropriate updates are made to the service request following release management guidelines and requirements.

Application Technical Support is responsible for the following SAP configuration items which have financial implications and are largely cross functional in nature. Any one change could negatively impact multiple teams and processes if appropriate level of system knowledge and core system design is not possessed by the individual responsible for the changes:

- Validation Rules
- Substitution Rules
- Budgetary Ledger Classification
- Budget Control System (Accounts Receivable, Budget Distribution, Anticipated Accounting)
- New document types
- Splitting logic
- Account Determination

**Year End Execution**

ATS is responsible for testing and executing the system close of the Agency's Financial data on a yearly basis. This requires extensive knowledge of SAP's closing programs and details about NASA's Financial data. It also requires close coordination with the Office of the Chief Financial Officer, NEACC Release Management team and NEACC management to work through any issues. Any errors identified during the close, which may be transaction related or technical, are analyzed by the ATS Team and resolved through coordination with the appropriate parties. This type of analysis requires a wide range of technical, system and functional knowledge to independently research and identify solutions. The Financial system close is a time sensitive process and requires working unusual hours, extended hours and weekends for both the final round of system integration testing and production execution.

**Data Analysis and System Monitoring Programs**

ATS serves as the next tier of internal support to NEACC Application Functional Support teams and to the Centers and Agency on challenging system issues. The ATS team is consulted to research, explain and provide correction approaches. ATS is also responsible for assessing data monitoring programs available in SAP, providing recommendation on the use of such programs in the Agency configuration. The team schedules these programs to run at regular intervals, reviews the results and addresses any issues identified. Additionally, the ATS Team provides

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on-going reconciliation support for complex system issues including guidance on executing specific types of corrections.

**Audit Support /Data Collection (and ad-hoc requests)**

ATS supports multiple audit requests for data collection and analysis occurring on a regular basis in support of audit and also ad-hoc data requests.

**Vendor Relationship Management**

The ATS Team maintains a close relationship with SAP in several areas of the NEACC. The team's general focus allows them to provide clarity and unbiased assessments for any effort, service or tool provided by an external vendor to make the best decisions and recommendations for the Agency. The team is responsible for logging the majority of functional related customer messages with SAP. The ATS team provides both functional and technical information in the customer message and performs the initial testing of any note provided by SAP prior to handing off to the Application Functional Support team for full testing. ATS also assesses the code included in the note to confirm whether it is isolated to the applicable problem or touches other areas of system functionality which increases the risk or application.

ATS serves as a point of contact for special services such as SAP Escalation and Max Attention. The ATS team provides detail knowledge of system issues and the business impact of those issues, while working with SAP to develop and test correction processes and execute those corrections on behalf of the Centers.

ATS also serves in a testing and liaison role for new tools and capabilities by coordinating with vendor representatives to assess new products and functionality. ATS evaluates the product and its applicability for NASA's use. The team uses their system knowledge and expertise to determine whether the tool would be useful and makes a recommendation to NEACC Management on the benefit of purchasing the product.

**Release and Activity/Project Support**

The ATS Team is responsible for testing specific SRs such as updates to any correction programs, tools or processes. Team members serve as a second tier of support for system integration testing working functional defects where they are responsible for researching and providing resolution for any issue assigned to ATS.

ATS is also responsible for providing system and configuration support to any NEACC activity or project. Support includes detailed system knowledge and knowledge of current system design and configuration. The team is also responsible for specific areas of configuration and ensuring that existing processes and procedures are unaffected. ATS plays an active role on any project or activity requiring large and complex updates or efforts such as archiving, upgrades, support pack applications, and enhancement pack applications.

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**Special Procedures/Programs/Tools**

ATS is responsible for the initial execution of high risk tools and processes in NASA's Financial system. As the process matures and risks are understood and mitigated, the Agency may extend the use of the tool/process to the Centers. The ATS Team conducts knowledge transition sessions for the Centers and provides on-going support to Centers using the tools/processes.

Due to the volatility of the tool/process or the centralized nature of support, the NEACC ATS team retains the authority to execute the following:

- Special Purpose Ledger (SPL) Reposts
- Fund Management (FM) Deletion/FM Adjustments
- Payment Correction Tool
- WinRunner (Scripting tool)
- Monarch (program for organizing large volumes of data)

**Financial Internal Controls and Audit:**

The Financial Internal Controls and Audit Team (ICAT) serves as a liaison between NEACC management and the Office of the Chief Financial Officer (OCFO) in addressing audit issues, supporting external reporting and Agency/Center reconciliation activity.

The tasks listed below are inherently governmental and will be retained by the ICAT team:

- Creation/modification of General Ledger (GL) account reconciliation tools which directly affect the Continuous Monitoring Program (CMP) monthly activities performed by the OCFO and Centers
- Creation of reports for external reporting and for support of CMP monthly activities;
- Creation/modification regulatory Financial Statement reports;
- Supporting Centers and OCFO concerning data issues
  - Coordination required with NEACC ATS Team on issues/root causes/corrective action plan
- Creation/maintenance of Agency master data which has an intricate correlation with Agency external reporting requirements :
  - Fund
  - Application of Funds
  - GL accounts
- Execution of the SAP Goods Receipt/Invoice Receipt (GR/IR) reconciliation program and resolution of any issues identified
- Liaison with OCFO Quality Assurance Division concerning audits, both financial and Information Technology (IT), and A-123 concerns
- Validation of major release transactional testing to ensure expected results are obtained, including analysis of any Funds Management (FM) / Financial Accounting (FI) differences identified

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- Quarterly support to OCFO of issues with adjustments or research of issues as needed
- OCFO Liaison for definition of annual Financial closing rules, including the creation of any new GL accounts identified, as well as coordination of OCFO testing/validation of fiscal year end process
- Coordinate ad hoc data requests from OCFO Financial Management Division across NEACC teams
- Lead the SGL/Reconciliation Super User telecom forum
- Monthly execution of the FI recons

Access Management and Technical Approval:

- Review all NEACC NASA Account Management System (NAMS) requests and approve/reject as appropriate
- Review NAMS requests as required from Centers and approve/reject as appropriate
- Review special temporary access requests, for NEACC and Centers, and approve/reject as appropriate
- Lead NEACC Security teleconference with Center Security Administrators (CSAs)
- Review and technically approve all production migrations
- Open/Close fiscal periods in all SAP R/3 clients

**1.2.4 Enterprise Application Strategy and Planning**

The Government provides oversight and input into the technical operations of the NEACC. As with the Business Process Support area, the NEACC has developed a level of technical expertise related to the platforms and technologies that span the Lines of Business. The Government currently manages the overall infrastructure operations and planning work stream calendar, which consists of a large set of milestones encompassing all the deliverables in the System Management and Platform Management worlds. This work stream view provides an invaluable mechanism for understanding demand and adequately provisioning resources to accommodate infrastructure activities required to support NEACC operations.

In addition, the Government provides experienced resources to support many aspects of application development and application technology evaluation.

The Government will retain authority for the Enterprise Applications Strategy and Planning functions across all Lines of Business. These functions include: maintaining technology and application roadmaps that address NASA's short and long-term Enterprise Application needs; providing input and direction for Business Case Analyses in support of new Enterprise Application service initiatives; establishing a point of view on technology optimization strategies; evaluating service initiatives within the broader Enterprise Architecture context; providing an Enterprise perspective on Information Technology as it relates to NASA's Enterprise Application Portfolios.

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## **2 PROGRAM MANAGEMENT**

Under the current UNITEs contract the Contractor is required to perform Program Management functions in support of managing the overall contract. The contractor performs management activities necessary to plan, execute, control, and report project performance, schedules, and resources. Program Management consists of Contract Management; Financial Management;; Procurement; Asset Management; Program Support; Security Management; and Safety Health and Environmental.

### **2.1 Contract Management**

Contract Management includes all contract administration functions and activities required in the performance of the contract.

The NEACC has historically operated in an environment that emphasizes timely, open communications between NASA and its contractor partner. Key to this partnership has been the vesting of autonomy and authority to the contract Program Manager to make and implement critical decisions on behalf the contract's prime and subcontract team members.

Also key to the NASA-Contractor Partner relationship is the ability to work in a collaborative manner to develop a strategic vision for the NEACC and plans to ensure the vision is achieved to the mutual benefit of the NEACC, its contractor partner, and the Agency.

### **2.2 Financial Management**

The NEACC is responsible for providing budget input to the Agency's annual Performance, Planning, Budgeting, and Execution (PPBE) process for the purpose of establishing Information Technology (IT) budgets for all NEACC funding organizations. To accomplish this, the NEACC is required to collect budget data in sufficient detail to:

- Identify opportunities to achieve efficiencies, improved integration and security, and ensure alignment of the IT with the Agency's mission
- Make decisions for funding alignment
- Provide cost phasing plans
- Meet internal and external reporting requirements such as the Office of Management and Budget (OMB) Circular A-11
- Provide metric reporting for IT investments to OMB and other internal and external entities

The NEACC is also required to provide monthly Plan vs. Actual (PvA) cost reports to ensure that Agency guidelines for the commitment, obligation and costing of funds are met.

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### 2.3 Procurement

The UNITEs contractor acquires new equipment on behalf of the NEACC and maintains the annual maintenance and license agreements for all hardware and software within the NEACC inventory.

The number of purchase requests associated with the annual renewal of hardware maintenance and software license agreements can be anticipated as follows:

Annual HW/SW Maintenance Activity		
Purchase Request Size	Number of PRs	Total Value (\$K)
< \$100K	60	570
> \$100K	15	3,930
Total	75	4,500

The number of purchase requests associated with the acquisition of new equipment is less predictable. Historically the NEACC has procured \$1,000,000 - \$2,000,000 of new equipment annually. These procurements are typically executed in a range of 5 -10 separate purchase request. However, these amounts can vary depending on requirements as well as budget guidelines and constraints. With the transition of NEACC systems to the hosting services provided by the NASA Enterprise Data Center (NEDC), it is anticipated that the volume of hardware procurements required by the EAST contractor will be dramatically reduced from current levels.

### 2.4 Program Support

In the Program Support area, the UNITEs contractor is required to prepare and present a monthly overview of the priorities, status, accomplishments, risks and issues associated with the delivery of day to day operations of the NEACC as well as any on-going implementation tasks.

### 2.5 Security Management

The NEACC is required to adhere to all federal NASA IT Security Requirements. These requirements are identified in Attachment **J-1**, Appendix **A**, *Cross Functional Requirements, Section 6*.

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## 2.6 Safety, Health and Environmental

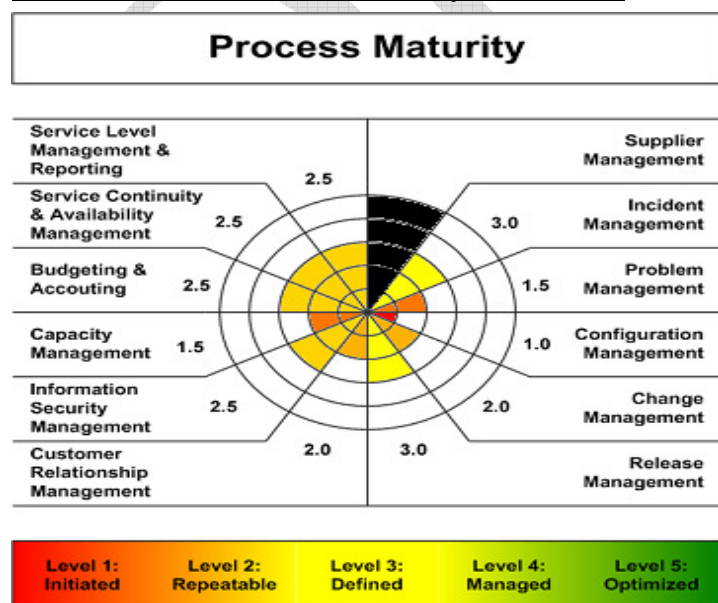
Safety, Health and Environmental (SHE) involves the preparation and implementation of health and safety policies and procedures in compliance with Occupational Safety and Health Administration (OSHA), NASA, and Marshall Space Flight Center (MSFC) standards and requirements. This requirement includes annual safety inspections and surveys of all workspace utilized by the contractor, monthly safety and health meetings with the entire UNITEs workforce, annual safety training for all UNITEs employees and the reporting of occupational injuries and illnesses.

## 3 APPLICATIONS OPERATIONS

Applications Operations describes the central activities associated with the NEACC's core mission. These activities are the primary services visible to the NEACC's stakeholder and end-user communities, as they result in the application capabilities required by these communities to perform their jobs. To successfully complete Application Operations work, coordination is required between the appropriate skill sets that comprise all five Delivery Functions as described in Attachment **J-1**, *PWS, Section 5.0*.

The NEACC has worked to continually evolve and mature the processes used to manage NEACC operations. As part of these improvement efforts, the NEACC and the UNITEs contractor undertook an assessment of the level of alignment between NEACC procedures and ITIL Version 2.0 processes. With the exception of Supplier Management, the assessment noted some level of alignment between NEACC and ITIL Version 2.0 processes in all assessed areas. Certain process areas, such as Incident and Release Management, demonstrated a higher level of alignment, while others, such as Configuration Management, were rated as less mature.

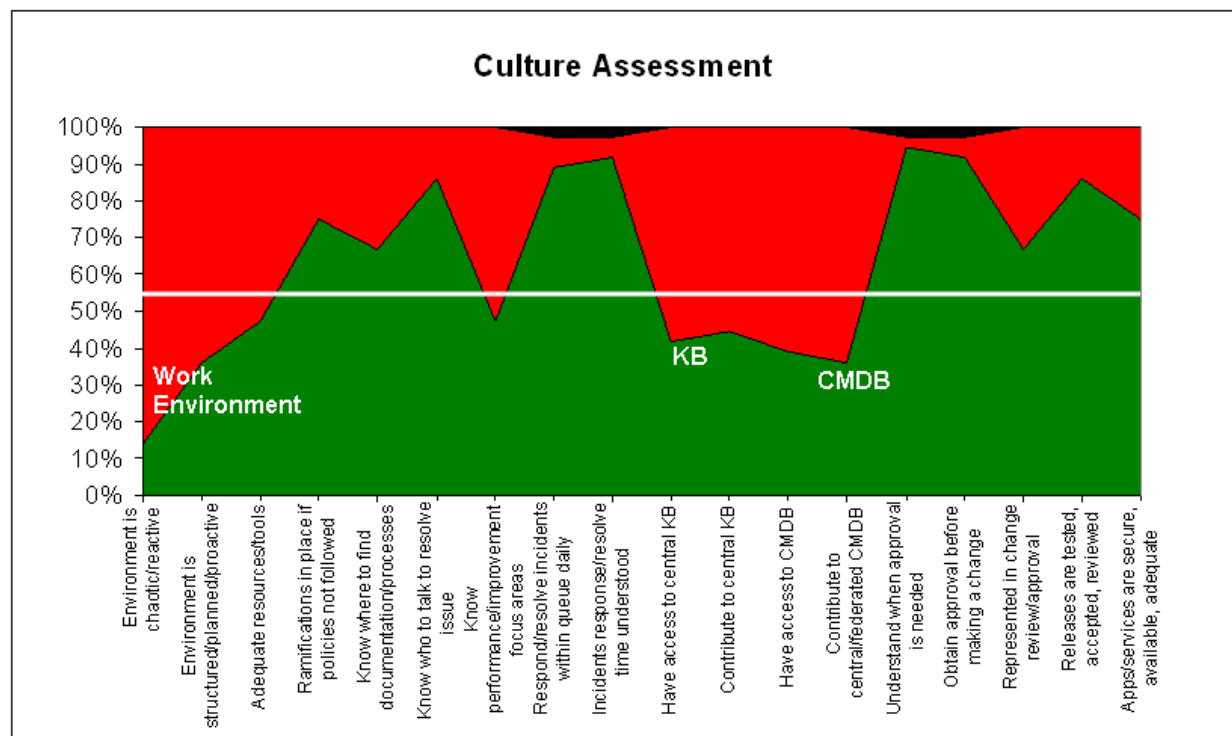
### NEACC ITIL Version 2.0 Maturity Assessment:





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The following diagram summarizes the Service Management attitudes and culture within the NEACC, based on the ITIL Version 2.0 assessment. Areas of green represent a high level of understanding and acceptance, while red indicates areas that are less mature or well-established.



### Current IEMP Help Desk Model:

In the current operational environment, MSFC operates a Help Desk and supporting call center known as the NASA Incident Services Center (NISC). NISC personnel staff the call center 24/7 and log incidents in an MSFC-operated Remedy application. Some NASA centers also offer center-specific Help Desks that add an additional layer of Help Desk support. Users are also permitted to log into Remedy and directly enter and submit their incidents. The NEACC has a separate, MSFC-operated instance of Remedy that is used to manage all NEACC incidents and requests. The NEACC Remedy system is configured with specific attributes and workflows that are required to ensure the appropriate routing and approvals of work performed and to provide required data to NEACC management and stakeholders.

Under the I<sup>3</sup>P consolidation of Agency IT services and infrastructure, the NISC and the NEACC Remedy system will be replaced by the NASA Enterprise Service Desk (ESD), which will utilize a new, centralized incident management and Enterprise Service Request System (ESRS). For details on the ESD and ESRS refer to Attachment **J-1**, Appendix **A**, *Cross Functional Requirements*. It is anticipated that the ESD will house the NEACC Tier 2 attributes and workflows currently available in the existing NEACC Remedy system described above. The

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EAST contractor must ensure that these attributes are updated and the workflows are followed as described in Attachment **J-1**, Appendix **A**.

### 3.1 Applications Maintenance

Applications Maintenance describes a core set of non-discretionary activities that must be performed to service the needs of NEACC end-users and to keep NEACC applications available, current, and in optimal working condition. Application Maintenance is defined as all activities, both direct and of a supporting nature, that are performed to complete the service request types specified in Attachment **J-1**, *PWS, Section 3.1*.

The historical data from Applications Maintenance requests completed during the fiscal year period of 2008 are recorded in the Attachment **L-B1**, *Background & Historical - Resource Baseline*. The service request data captured for some Lines of Business is more complete than for others. These differences in the quantity and quality of the data are the result of the integration timelines of each Line of Business into the NEACC processes and procedures. Some Lines of Business, such as Financial and Procurement, have been integrated into the NEACC processes from their inception. Therefore, the service request data logged for those Lines of Business has consistently followed established guidelines, utilizing the NEACC Help Desk and change control processes. Lines of Business such as ICAM were migrated to the NEACC more recently and therefore have a thinner history of service request data within the standard NEACC incident tracking systems.

### 3.2 Applications Enhancement

Applications Enhancement describes a core set of activities that are performed to improve and optimize existing application capabilities. It is important to note that although a distinction is made today between Applications Maintenance (pure “run”) and Applications Enhancement work, there is no organizational, contractual, or reporting requirement that insists on a clear distinction between the two categories of requests. Under the EAST contract there will be a clear distinction between Applications Maintenance and Applications Enhancement.

It is also important to note that there is little or no difference between the Delivery Functions and processes that must be applied to complete ‘run’ versus ‘enhance’ requests. In both cases, skilled resources are needed from all directly impacted areas, such as Application Functional Support and Application Development, as well as supporting functions, such as Systems Management, Application Operations Maintenance, etc.

Applications Enhancements are currently evaluated by NEACC resources from across the impacted Delivery Functions, and are evaluated utilizing the NEACC Governance processes. Specifically, enhancement requests are reviewed and prioritized by the relevant Functional Control Board (FCB), then assigned to an upcoming release by the NEACC RRB.

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Under the EAST contract, the Government will continue to lead Demand Management activities by prioritizing Applications Enhancement requests across Lines of Business and by working with the EAST Contractor to assign requests to the appropriate release, based on request priority and EAST Contractor operating level capacity.

### Service Ordering System

Under the I<sup>3</sup>P consolidation of Agency IT services and infrastructure, the NISC and the NEACC Remedy system will be replaced by the NASA Enterprise Service Desk (ESD), which will utilize a new, centralized incident management and Enterprise Service Request System (ESRS). For details on the ESD and ESRS refer to Attachment **J-1**, Appendix **A**, *Cross Functional Requirements*.

### Event Planning

The NEACC hosts both recurring and nonrecurring events designed to provide networking and learning opportunities for the leaders and enablers of our end user communities. The largest recurring event is the annual Center Business Process Lead Summit. The UNITEs contractor assists with the preparation and execution of NEACC events.

### Survey Support

The NEACC currently conducts an annual survey to gauge customer satisfaction with its applications and support. Results of the survey are used in reporting on program performance to Congress, and in identifying improvements and corrective actions.

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**Applications Overview – Detailed Information****3.2.1 Financial Line of Business**

The Financial Line of Business represents a large set of functionality that spans NASA's Financial Accounting, Budgeting, Asset Accounting and Travel functions. The Financial Line of Business is comprised of the following operational applications:

- Core Financial
- Electronic Travel Management System (eTravel)
- eBudget Suite
  - Clearinghouse
  - Integrated Budget & Performance (IBPD)
  - Budget Formulation (N2)
  - Metadata Manager (Mdm)

**3.2.1.1 Core Financial**

The Core Financial module represents a large set of functionality that spans NASA's Financial Accounting and Asset Accounting functions. Core Financial consists of the following sub-processes.

**Budget and Projects**

The Budget and Projects sub-process utilizes the SAP Budget Control System in the Funds Management (FM) module, the Controlling (CO) module and the Project Systems (PS) module to:

- Establish and maintain NASA budget structure
- Record and maintain Agency Operating Plan
- Record and maintain Agency Execution Plan
- Record and maintain Phasing Plan
- Execute Budget Distribution

**Cost Management**

The Cost Management sub-process utilizes the SAP Financial (FI) module and the CO module to record cost related to services.

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Cost Management supports end users located at multiple NASA centers with the recording of costs:

- Monthly cost accrual and reversal processing
- Cost Assessment processing which provides for cost to be collected in a pool and then allocated or 'assessed' to various programs/projects based on pre-defined agreements.
- Processing of supply type transactions both receipt and issues

**Largest Areas of Customization:**

1. Contractor Cost Reporting (CCR) Custom programs to process the contractor cost (NF533) reported monthly. This consists of multiple custom programs that have complex calculations to separate the actual and estimated cost. Approximately 85% of NASA's cost is processed through the programs. The cost is posted with a standard SAP transaction code.
2. Straight Line Extension – Custom program (Straight-Line Extension) to process other cost that is not NF533 related. These programs calculate service related cost and then the cost is posted into the accounting system with a standard SAP transaction code.
3. Multiple custom interfaces that process supply type transactions.

**Accounts Payable**

The Accounts Payable (AP) sub-process utilizes the SAP FI module and the Materials Management (MM) module to provide Invoice Processing, Payment confirmations with Treasury, Grant Processing using Health and Human Services (HHS) Payment Management System, International Payment and Collection (IPAC) Processing. Centralized Vendor master data related to payment processing is also included in this sub-process.

Accounts Payable (AP) is responsible for NASA vendor payments. Vendor Payments are sent to Treasury on a daily basis via an outbound flat file. The payments are paid the next day and a confirmation file is received after the payment has been made and/or rejected NASA Grants, which are provided via Letter of Credit financing, are managed from a payment perspective by the Department of Health and Human Services. These documents are issued and managed at the individual contract level. NASA has three interfaces to support this process. AP supports the inbound purchasing card statements and invoices for payment.

Payments to other government agencies are achieved via a flat file sent to the Intra-Governmental Payment and Collection System (IPAC).

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## Largest Areas of Customization:

1. Treasury
  - a. Outbound Treasury Payment File
  - b. Inbound Payment Confirmation File
2. Department of Health and Human Services
  - a. Outbound Authority File
  - b. Inbound Drawdown File
  - c. Inbound 272 Quarterly File
3. Purchasing Card Bank Payments
  - a. Inbound Bankcard statement and invoices
4. Intra-Governmental Payment and Collection System (IPAC)

**Accounts Receivable**

The Accounts Receivable (AR) sub-process utilizes the SAP FI, FM and Sales Distribution modules to support Accounts Receivable for Reimbursable Agreements and non-reimbursable receivables.

## Largest Areas of Customization:

1. Several custom programs to prevent end users from processing sales orders and bills incorrectly
2. Interface with Intra-Governmental Payment and Collection System (IPAC)
3. Interface with Reimbursable Roll Up (unique interface for the Stennis Space Center)

**Asset Accounting**

The Asset Accounting sub-process comprises functions used to manage capital assets, including asset master record management, integration with Equipment Management, automated depreciation, and reporting. Provides support for recording all NASA Owned/NASA Held and NASA Owned/Contractor Held Equipment, Internal Use Software, Theme Assets, Capital Leases and new Real Property items that fall under NASA Policy Directive 9250. Provides support for the recording of Depreciation. Provides support for the transfers of capital assets either from another government agency or internally from one center or another. Provides support for retirement of capital assets.

## Largest Areas of Customization:

1. Asset Master Record / Equipment Master Record Reconciliation

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**3.2.1.2 eBudget Suite**

NASA's eBudget suite of applications provides an integrated solution to facilitate NASA's Planning, Programming, Budgeting and Execution (PPBE) process.

Clearinghouse is the Agency's document repository for managing electronic Office of Management and Budget (OMB) documents, the Budget Offices' related PPBE documents, and the Office of Legislative and Intergovernmental Affairs (OLIA) budget documents. Clearinghouse is a standalone custom application.

Integrated Budget & Performance (IBPD) is a tool used for NASA's Congressional Justification with OMB and Congress. IBPD is a standalone custom application.

Budget Formulation (N2) is NASA's Agency budget formulation tool which enables online budget entry, upload, and review for the PPBE and other budget related activities. N2 is a standalone custom application.

Metadata Manager (Mdm) is a tool which provides an integrated system for managing master data records and provides front-end universal access for Centers to submit master data requirements.

**3.2.1 eTravel**

NASA implemented Electronic Data Systems (EDS) FedTraveler.com commercial off the shelf (COTS) travel management solution under an eGov initiative in February 2009. FedTraveler.com is a service provider and maintained by EDS. EDS is responsible for software release/configuration update tasks, Agency-level system/hardware configuration and help desk application support. NASA's responsibility for system maintenance is limited to master data and technical interfaces to NASA systems (SAP, BW, NAMS and FPPS)

The eTravel solution will provide NASA employees with one tool for completing all travel activities. Consequently, the "de-commission" of the current Travel Manager system is planned as part of the eTravel implementation strategy.

**Largest Areas of Customization:**

1. Account Code, Funds Availability, Travel Document integration with the Core Financial application
2. User, Traveler Profile, Identity Management and Account Management integrations with NAMS
3. Traveler Profile integration with Federal Personnel and Payroll System
4. Travel Management level Reporting integration with BW

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**3.2.2 Logistics Line of Business**

The Logistics line of business includes Equipment Management, Inventory Management, and Disposal Management.

**Equipment Management**

The Equipment Management sub-process provides functionality that includes how NASA acquires and disposes the equipment. The events in the life of the equipment are managed by transactions, a web based tool and an automated inventory process. It also maintains Agency and Center level Custodian and Manufacturer master data.

Largest Areas of Customization:

1. Extensions to Equipment Master Record transaction in the Plant Maintenance module
2. Web Frontend for Property end-users and Custodians (N-PROP)
3. Application is integrated with Disposal Management (DSPL) to excess and reutilize equipment
4. Application is integrated with NASA Enterprise Directory (NED)
5. Application is integrated with Asset Accounting for capital equipment
6. Custom reports in business warehouse for legacy system history and also current transactional data

**Inventory Management**

Inventory Management functionality within NASA's SAP ERP is completely custom built. This sub-process provides custom transactions in SAP, interfaces with bar code data collected, and provides custom reports.

**Web-based Property Management (N-PROP)**

N-PROP is a web-based front end to the equipment management system that allows any equipment end user in NASA a limited amount of functionality related to their equipment. This functionality includes accepting accountability; managing attributes such as location, end users and custodians; creating property passes and reports of equipment; as well as reporting the equipment as excess. N-PROP interfaces directly with SAP and manages updates in real time.

**Web-based Property Disposal (DSPL)**

DSPL is a custom built web application that provides the NASA Agency-wide disposal solution. All excess property at NASA is processed through DSPL; not only the equipment managed through SAP but also supplies managed in NSMS and other non-controlled property.

DSPL is integrated with General Services Administration's (GSA) federal screening application in two ways. Using a web service, DSPL transmits property information to GSA in real-time for immediate screening. Time based activity is submitted to GSA through a batch file interface.



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**NASA Supply Management System (NSMS)**

NSMS provides NASA with an Agency-wide supply/logistics system to support operational requirements for the Receiving, Issuing, Replenishing, and overall control of non-capital supply items. NSMS is a custom built mainframe based system running on a Software AG platform (ADABAS/Natural).

NSMS interfaces with Defense Logistics Services Center (DLSC), Defense Automated Message Execution System (DAMES), DSPL and Core Financial.

**NASA Online Supply Catalog (NOSC)**

NOSC is a custom built web-based application that provides NSMS users with a Just-In-Time (JIT) ordering capability. Orders generated in NOSC are transmitted via Electronic Data Interchange (EDI) to the trading partner. NOSC displays all supplies that are in NSMS as a catalog to support on-line shopping.

**3.2.3 Procurement Line of Business**

The Procurement Line of Business represents a large set of functionality that provides NASA's Contract/Grant administration, Purchase Card tracking and payment, and industry access to NASA procurement information. The Procurement Line of Business is comprised of the following operational applications:

- Contract Management (Compusearch Prism)
- SAP Purchasing
- Purchasing Card (P-Card)
- NASA Acquisition Internet Service (NAIS)
  - Electronic Posting System (EPS)
  - Central Feedback
  - Global Login
  - NAIS Procurement Data Store (NPDS)
  - NASA Procurement Data View (NPDV)
  - Procurement Data Warehouse System (PDWS)
  - Procurement Master Data Dictionary (PMDD)
  - Past Performance Database System (PPDB)
  - Request for Quote System (RFQS)

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**Contract Management Module (CMM)**

The Compusearch Prism COTS package is a comprehensive tool to support contract/grant writing, limited data reporting/management, procurement workload management, and contract/grant administration for NASA. The functionality provided by CMM provides added efficiency to the procurement processes, including automated updates of Federal Acquisition Regulation (FAR) and NASA FAR Supplement (NFS), as well as integration with the SAP financial backbone.

**Largest Areas of Customization:**

1. Purchase Request (PR) from SAP to CMM
2. PR Accept/Reject from CMM to SAP
3. PR Buyer Assignment from CMM to SAP
4. Award Validation from CMM to SAP
5. Award (Outline Agreement and/or Purchase Order (PO)) from CMM to SAP
6. Award modification data from CMM to SAP
7. Vendor data from SAP to CMM

**SAP Purchasing**

SAP Purchasing provides the capability for NASA users to create Purchase Requisitions and route them electronically for approval. NASA also utilizes the Purchase Order capability within SAP for limited Outside Buyer (or Outside Procurement) transactions. In addition, all contractual actions developed by Procurement in the Contract Management Module PRISM document generation tool are interfaced to SAP.

**Largest Areas of Customization:**

1. Reporting
2. Orders, Receipts, and Invoices from the NASA Supply Management System (NSMS)

**Purchasing Card**

NASA utilizes the P-Card Web Solutions as its purchasing card system. P-Card allows NASA users the ability to simplify the tracking and payment of credit card purchases by providing for the reconciliation of individual purchase credit card transactions against their monthly statements. NASA's credit card provider (i.e., bank) is JPMorgan Chase.

**Largest Areas of Customization:**

1. P-Card Order creates a Purchase Requisition in SAP via a real-time interface
2. P-Card Statement Reconciliation and Invoice Payment creates Purchase Orders, Invoices, and Credit Memos in SAP via a batch interface

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**NASA Acquisition Internet Service (NAIS)**

NAIS is a custom built web-based Agencywide suite of Procurement applications which provide 24x7 on-line access to NASA procurement information including advance procurement notices, solicitations, financial and contractual status summary information, and procurement regulations.

**Electronic Posting System (EPS)**

EPS enables procurement representatives to generate advance and post-award notices and post them into the NAIS business opportunities portal. Automatically transmits relevant information on these acquisition opportunities to the FedBizOps portal service and Grants.gov with links pointing back to the NAIS business opportunities portal containing the solicitation-related files.

**Central Feedback**

Central Feedback is a single database system that allows users to communicate their experiences (problems/suggestions) within all NAIS applications to NAIS management.

**Global Login**

Global Login provides strong, single-point authentication to all NAIS applications.

**NAIS Procurement Data Store (NPDS)**

NPDS contains NASA's post award procurement data since the FPDS-NG go live in 2004. It collects nightly data from FPDS-NG, integrates Buyers Information nightly from CMM, maintains source data in original format, and provides data feeds to NASA (PRIM, PPDB, NPDV) and Federal Systems (FFATA, NSF).

**NASA Procurement Data View (NPDV)**

NPDV provides an on-line web-based query with access to NASA's post-award summary level information.

**Procurement Data Warehouse System (PDWS)**

PDWS is NASA's FPDS-NG data repository which receives nightly feeds from FPDS-NG and provides data to PPDB, NPDV, and ad hoc queries.

**Procurement Master Data Dictionary (PMDD)**

PMDD is a data management tool for Procurement functional and technical users. It manages current procurement meta-data and makes it available in a central location.

**Past Performance Database System (PPDB)**

PPDB is a web-based application enabling the evaluation of contractor performance to satisfy FAR and NASA FAR supplement past performance evaluation requirements. It facilitates

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sharing of past performance evaluation information among the NASA centers in support of competitive proposal evaluations. It includes the capability for the Contracting Officer to complete the evaluation and the contractor to provide input on-line.

**Request for Quote System (RFQS)**

RFQS provides a form-based alternative solicitation that allows vendor transmission of quotes in response to simplified acquisition solicitations. It applies to all simplified acquisitions of commercial items between \$25,000 and \$5,000,000. RFQS automatically generates the bid abstract of vendor quotes and the purchase order of the successful quote.

**3.2.4 Human Capital and Workforce Line of Business**

The Human Capital and Workforce line of business represents a large set of functionality that spans NASA's Financial and Human Resources functions.

**Agency Labor Distribution System (ALDS)**

The Agency Labor distribution system is a custom-built application that provides NASA's labor distribution solution. It replaced the Centers' 10 legacy systems in October 2005. After payroll is processed in the Department of Interior's Federal Payroll and Personnel System (FPPS), the costed payroll is imported into ALDS for validation and funds distribution. Full time equivalent (FTE) calculation is performed, funds are validated, and the costed payroll data is posted into the financial system (SAP). Reports are available to the labor analyst to assist with the processing of labor. After posting is complete, Program/Project and Resource Managers can view the results of labor processing through various reports in the Business Warehouse (BW). The ALDS application also supports other Agency applications by providing information (via interfaces) for HR reporting and trending analysis and to project managers for workforce planning and budgeting.

**ePayroll**

In 2004, the e-Payroll project was one of the e-government initiatives within the President's Management Agenda and included the consolidation of numerous federal personnel and payroll software applications by among four service providers. Currently, e-Payroll is a centralized support team that provides assistance to the Agency in the use of the Department of Interior's (DOI) Federal Personnel & Payroll System (FPPS) and Datamart. The members of this team serve as the Agency's Subject Matter Experts (SME) for personnel and payroll action processing. The team represents the Agency in providing support and guidance to DOI by serving as the FPPS User Group representatives and the FPPS System and Security Administrators. The team is also responsible for the delivery of interfaces that provide data to FPPS such as: Time and Attendance, Awards, and Performance Ratings. The team provides FPPS data to centers/agency systems on a regular basis via interfaces: systems include workforce, security, travel, and competency management. The team also provides FPPS data to external customers such as the Office of Personnel Management (OPM), MetLife and Employee Express (EE). The custom built inbound /outbound e-Payroll interfaces currently total 45.

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**Human Capital Information Environment (HCIE)**

The Human Capital Information Environment (HCIE) contains the authoritative data source (ADS) for Human Capital information, applications used to manage Human Capital resources, and reporting tools integrated with other applications within NASA's IT infrastructure. HCIE provides all NASA employees with online access to near real-time Human Capital information through web-based portal technology. HCIE consolidates current Human Capital applications, eliminates redundant systems, and integrates the remaining Human Capital processes and systems.

**Historical NASA Personnel and Payroll System (HPPS)**

HPPS is a custom built web application that provides a finite set of historical NASA Personnel and Payroll System (NPPS) data to a limited set of NASA users.

**Secure Print Servers**

Secure Print Servers provide various options for routing print output to printers and print servers located at customer sites. These options include encrypted print and standard print. Each of these options requires that client sites provide the network address and queue.

**Position Description Management (PDM)**

PDM is a system for creating and submitting position descriptions for NASA Position openings. Data from this system is being put into the ePDM as PDM is being retired.

**Staffing and Recruiting System (StaRS)**

The NASA Staffing and Recruiting System (StaRS) application supports the end-to-end hiring process at NASA. StaRS contains the tools necessary to post job vacancies, in accordance with regulatory requirements, to the Office of Personnel Management's site USAJOBS.gov, receive resumes from USAJOBS.gov, process resumes into Resumix for skills extraction and storage, analyze candidates' skills, and complete the post interview hiring cycle with a paperless signature process. This is done with a mix of custom web code and a COTS product, Resumix. The destination of all StaRS actions is the Archive module which gives a 360-degree view of the hiring process for any given job. The Archive is used mainly to facilitate audits and other required reviews.

**Web-based Time and Attendance System (WebTADS)**

WebTADS is a custom built application that provides NASA with the agency's web-based time and attendance and labor collection. WebTADS allows for employee level entry of current timesheets as well as prior pay period adjustments. Leave taken by the employee is allocated, at the point of timesheet approval, to the projects directly supported by the employee. In addition to timesheet entry, the employee has access to many automated request processes in WebTADS. These processes include the request for advanced sick leave, the request to receive donated leave,

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the request to donate leave and the request to participate in the telework and Combined Federal Campaign programs. Many reports are available to various user roles (Timesheet Approvers, Project Analysts, Payroll, Human Resources, etc.) for delivering real-time reporting information.

### **3.2.5 Identity, Credential & Access Management (ICAM) Line of Business**

In 2003 and 2004, NASA began two separate but integrated projects called Centralized Badging and Access Control System (CBACS) and NASA Integrated Services Environment (NISE). The CBACS Project is designed to migrate existing isolated center badging systems to a centrally managed, integrated infrastructure and provide access to NASA physical resources using a standardized badge. The basic principle of the NISE Project was to move NASA's identity, directory and account management services and support functions from their current decentralized environments to an integrated, Agency system.

During 2004, the CBACS and NISE Project Teams evaluated recommended vendor design approaches, tradeoffs, implementation plans, and targeted providers. The top product alternatives were evaluated for cost and technical compatibility with existing NASA IT infrastructure and alignment with future objectives for development of this infrastructure. Based on solution architecture analysis, functions, features, pricing, references and comparison to expected future state of the NASA information infrastructure, the Government procured Sun Identity Manager, Sun One JAVA Directory, Sun Access Manager and Lenel OnGuard products.

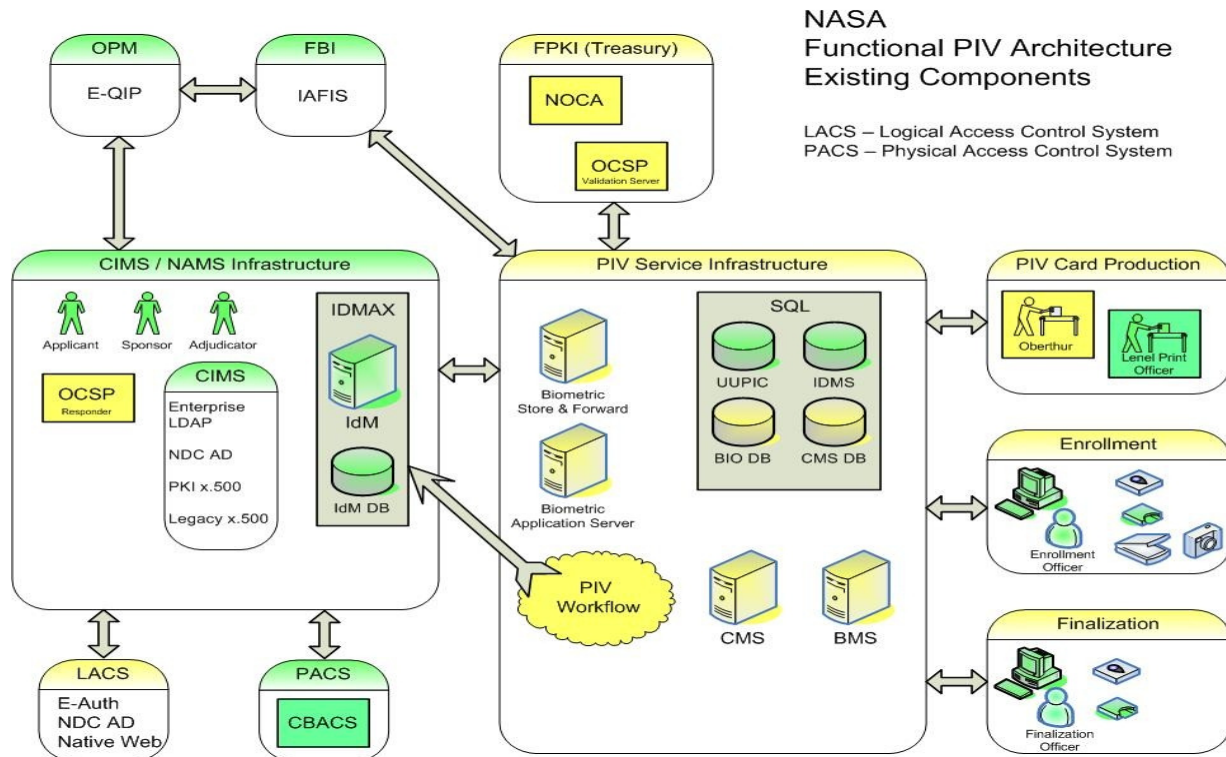
In 2004, Homeland Security Presidential Directory 12 (HSPD-12) was released and during 2005, the first version of Federal Information Processing Standard (FIPS) Publication 201 was released. These federal requirements along with the decision to use the Sun Identity Manager to provide workflow for Personal Identity Verification (PIV) and identity management processes further integrated both of these projects. Additional federal procurements were made to support HSPD-12 for PIV Enrollment, Biometric Application Services (BAS) and Card Management Services (CMS) for encoding and finalization of the PIV Badge.

The following Agency support teams were created to support the implementation of NISE, CBACS and HSPD-12 projects: Smartcard – consisting of center physical security leadership, NAMS – consisting of center IT application management leadership and Cyber Identity Management System (CIMS) – consisting of center IT data management leadership. Additionally, the HSPD-12 Implementation Manager team consists of center leadership that deploys integrated PIV processes between the different organizations within their center.

At the end of 2008, both the CBACS, NISE and HSPD-12 projects executed Project Closeout Reviews, completed merger into the NEACC Operational model and created an ICAM Business Architecture with an associated ICAM Line of Business. The ICAM architecture is separated into a) Identity Management b) Credential Management and c) Access Management. Access Management has been split into Physical and Logical access.

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Due to the nature of the data stored in the ICAM infrastructure, favorable background investigation must be on record with NASA for each team member. The type of investigation required is dependent on the user role within this infrastructure. A favorable National Agency Check with Inquiries (NACI) background investigation type is a minimum. There is also a requirement for the team member to be COTS certified on the platform they will be supporting.



**Figure 1 – NASA Functional PIV Architecture**

During 2009, the Agency project support teams are being re-organized to support the ICAM operational model as Functional Control Boards (FCB). Figure 2, *ICAM Operational Model* reflects the repurposing of center representatives to accommodate the new model. The FCBs are expected to be in place by April 2009.

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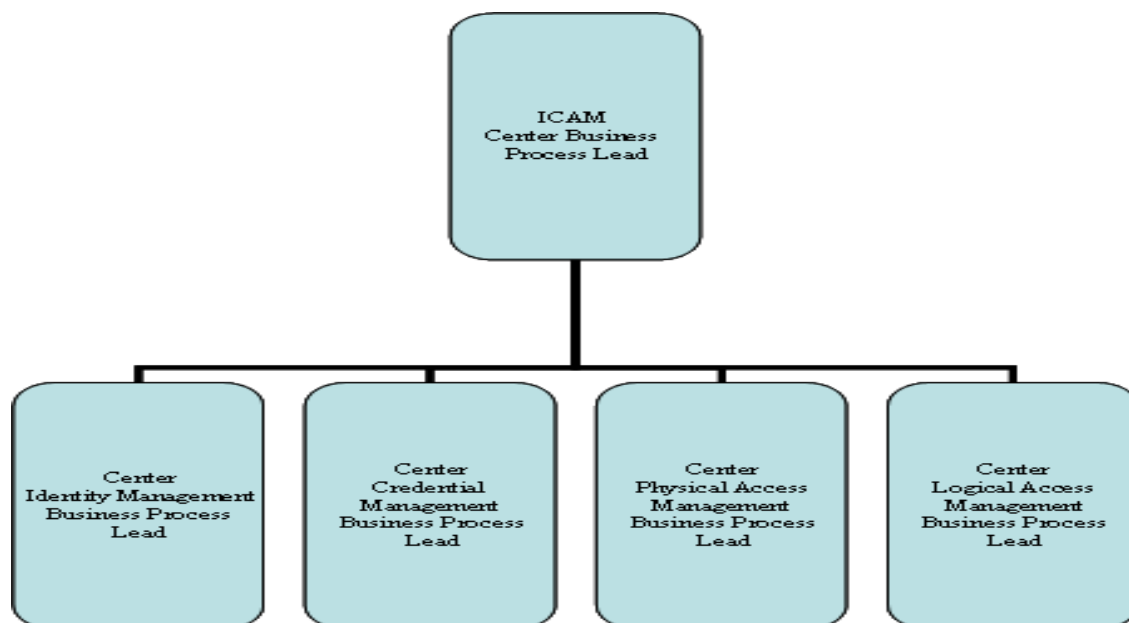


Figure 2 – ICAM Operational Model

### Identity Management

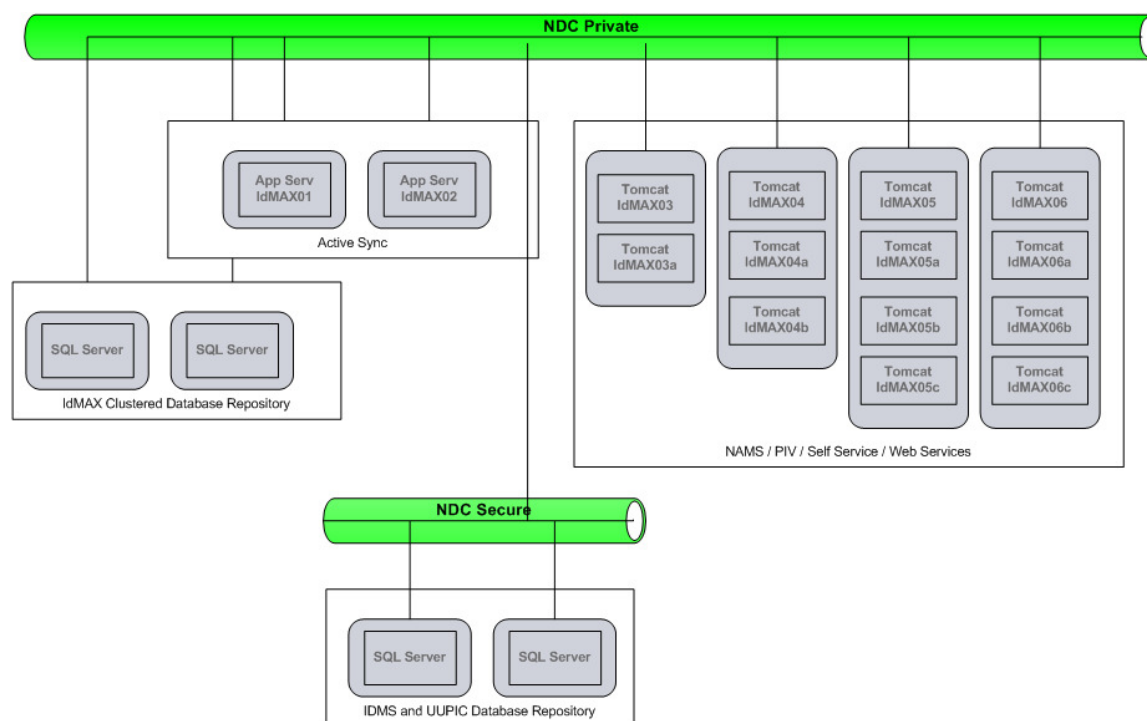
Identity management is defined as the creation, management and deletion of NASA Identities and associated data elements. This includes but is not limited to Social Security Number (SSN), Date of Birth, Place of Birth, Uniform Universal Personal Identifier Code (UUPIC), Last Name, First Name, and center unique location information. Data information is managed through a user and several system interfaces.

The Identity Physical architecture consists of the following systems:

Identity Management and Access Exchange (IdMAX)	Sun Identity Manager v 8.x Microsoft SQL 2005 – located on EACC Enterprise cluster
Data Management processing	Jitterbit – transforming to CC ESB Architecture
Identity Management Database (IDDB)	Microsoft SQL 2005 – located on NEACC Enterprise cluster
UUPIC	Microsoft SQL 2005 – located on NEACC Enterprise cluster



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**Figure 3 – IdMAX Physical Architecture**

NASA Worker Identities can be created via an IdMAX user interface or the interfaces with Human Capital and Security Foreign National systems. Non-NASA Worker Identities can be created via the IdMAX user interface. Table 1, *NED Data Mapping* describes how some of the identity attributes in the NASA Enterprise Directory (NED) are managed.

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NED Attribute	NASA - Create	NASA - Modification	Non-NASA Create	Non-NASA Modifications
First Name	WTTS	FPPS	Create Identity	Modify Identity
Middle	WTTS	FPPS	Create Identity	Modify Identity
Last Name	WTTS	FPPS	Create Identity	Modify Identity
Display Name	WTTS	USS	USS NAMS	USS
Email	WTTS	USS	NAMS	USS
Phone	Center IDA	Center IDA	Center IDA	Center IDA
Mobile	Center IDA	Center IDA	Center IDA	Center IDA
Fax	Center IDA	Center IDA	Center IDA	Center IDA
Address	Center IDA	Center IDA	Center IDA	Center IDA
Zip Code	Center IDA	Center IDA	Center IDA	Center IDA
City	Center IDA	Center IDA	Center IDA	Center IDA
Center	WTTS	FPPS	Create Identity	Modify Identity
Title	WTTS	FPPS	PIV Request	Center IDA
Org Code	WTTS	FPPS	PIV Request	Center IDA
Bus State	Center IDA	Center IDA	Center IDA	Center IDA
Building	Center IDA	Center IDA	Center IDA	Center IDA
Employer	WTTS		PIV Request	PIV Request
Room	Center IDA	Center IDA	Center IDA	Center IDA
UUPIC	Create Identity		Create Identity	
Agency User ID	Create Identity		Create Identity	
Legacy ID**	Center IDA	Center IDA	Center IDA	Center IDA
X.500 ID	Center IDA	Center IDA	Center IDA	Center IDA
US Citizen	WTTS	Modify Identity	Create Identity FNMS	Modify Identity FNMS
Status	PIV Process	PIV Process	PIV Process	PIV Process

**Table 1 - NED Data Mapping**

The Identity architecture interconnects and processes data with various systems as depicted in Table 2, *Identity Interfaces and Process*.

Interface	Approx. Qty	Description
IdMAX User Interface	On change 1,500/month	Creation of Non-NASA Worker identities
Workforce Transformation Tracking System (WTTS)	Processed daily 50/week	Creation of NASA Worker identities
Federal Personal Payroll System (FPPS)	Processed daily 500/week	Modification of NASA Worker identity information
NASA Foreign National Management System (FNMS)	Processed daily 500/month	Creation on Non-NASA Foreign National Worker

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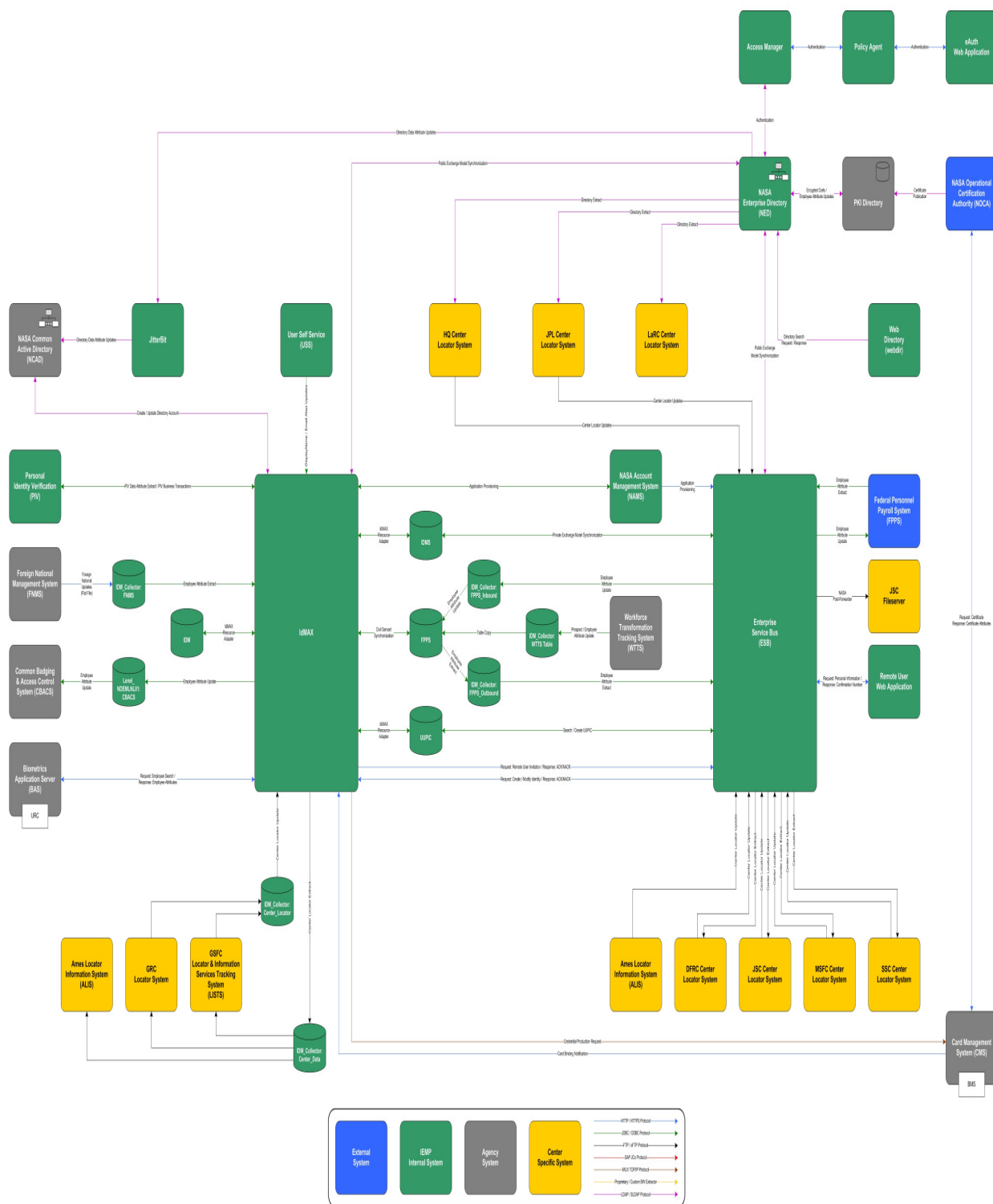
Interface	Approx. Qty	Description
OneNASA Email system	Processed nightly 3,000/day	Modification of NASA and Non-NASA identity information
Center Interfaces (12 unique)	Processed nightly 5,000/day	Modification of NASA and Non-NASA identity information
NED	Processed nightly 5,000/day	Published repository of identity information and used by several applications for authentication
NASA Consolidated Active Directory (NCAD)	Processed nightly 5,000/day	Published identity information
NASA Public Key Infrastructure (PKI) Directory	Processed nightly	Published identity information
Card Management System (CMS)	Processed every 15 minutes	Card Personalization Request (CPR) for Permanent Badge production (PIV Badge)
Universal Registration Client (URC)	Processed on demand	Identity Verification (PIV Enrollment)
BAS	Processed on demand	Identity Verification (PIV Enrollment)
Enterprise Physical Access Management System (EPACS)	Processed every 30 minutes – constraint of 500 records	Identity information to support center badge production and physical access

**Table 2 – Identity Interfaces and Processes**

The Identity infrastructure is going through a period of significant change. The current application architecture is shown in Figure 4, *ICAM Current State Application Architecture*. The transformation into a new configuration is shown in Figure 4A, *ICAM Future State Application Architecture*. The data architecture as shown in Figure 5, *ICAM Identity Data Architecture Model* is being implemented during calendar year 2009. A supporting centralized audit capability is included in the Enterprise Service Bus (ESB) architecture as shown.

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## ICAM Current State Application Architecture



### Figure 4 – ICAM Current State Application Architecture



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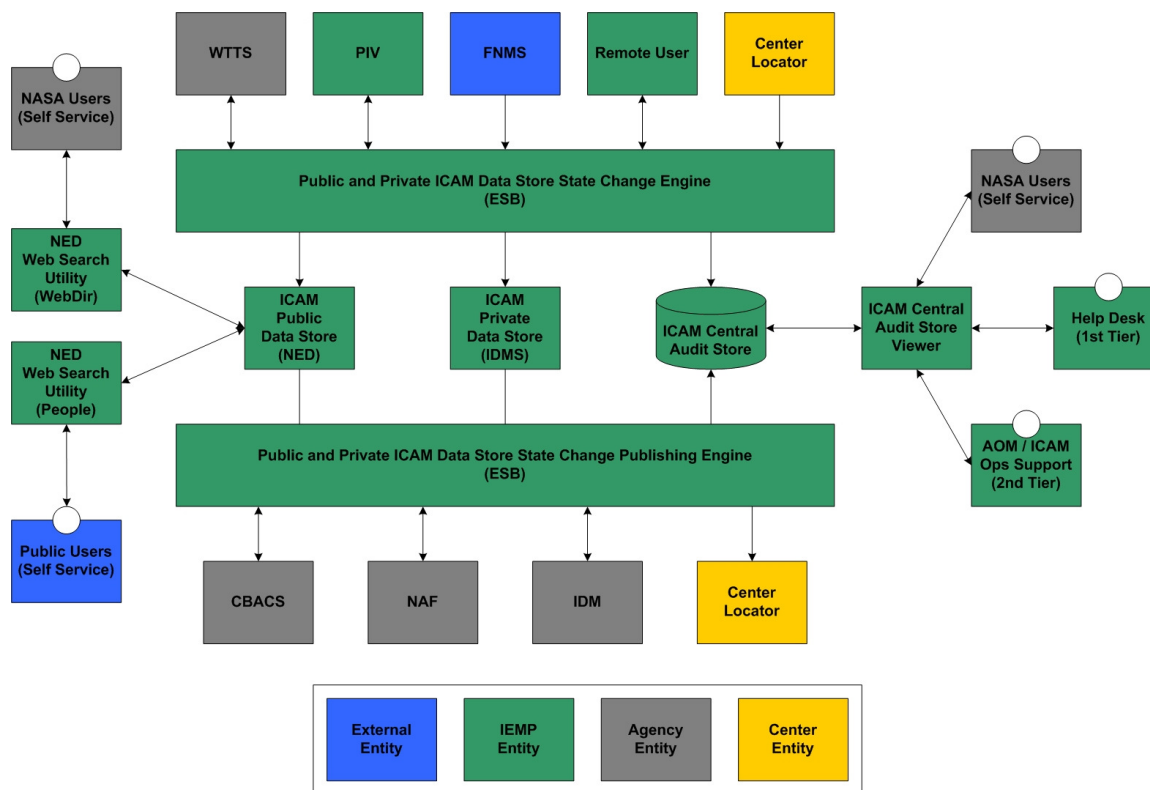
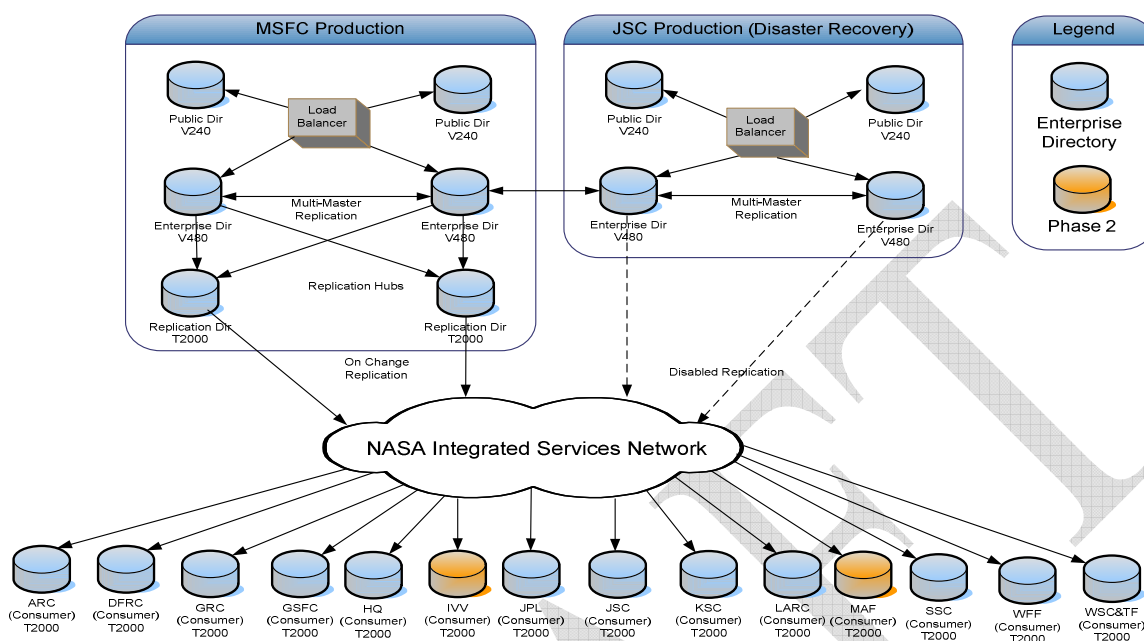


Figure 5 – ICAM Identity Data Architecture Model

**NASA Enterprise Directory**

The NASA Enterprise Directory (NED), as shown in Figure 6, – *NASA Enterprise Directory Physical Architecture*, is the repository of identity information to be made available to the agency. A small sub-set of this identity information is made available to the public via the Internet. There are supporting web interfaces to both the public and private instances of NED. Several applications use NED for authentication and therefore are a highly visible component of the ICAM architecture.

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**Figure 6 - NASA Enterprise Directory Physical Architecture**

**User Self Service (USS)** was implemented in December 2008. This application allows end users to request modifications of common names, display names in the Agency email system (NASA Operational Messaging and Directory (NOMAD)), request Agency email services and managing email addresses with a prefix of @nasa.gov. This information is published in the NED, NOMAD NASA Post Forwarders (NPF) and the NOMAD Active Directory.

**PIV Workflow** is the process to support HSPD-12 as documented in FIPS 201. At a high level, NASA Identities are created using the Identity Management system and processes. These identities are sponsored, validated, verified and produced appropriate to the credential that has been requested. The credentials that are currently issued are the Permanent (PIV) Badge. The FIPS 201 Badge Renewal process is planned to be released during April 2009. The FIPS 201 Badge Reissuance process is expected to be released by Summer 2009. Additionally a NASA Temporary Badge process will also be released by Summer 2009.

**Remote User** process is designed to accommodate NASA IT users that do not require physical access to a NASA Center. There are two implementations: a) the user submits their PII information directly into IdMAX via ESB integration and b) a PIV Requestor submits the users PII information on their behalf. Once the request has been submitted and approved by the identified Sponsor, the center PIV Authorizer authorizes this user for access NASA's IT Infrastructure. This is only a short term solution until the Federal Infrastructure can accommodate this use case.

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**Credential Management**

Credential Management provides the centralized service for management of NASA Credentials used to access physical and logical resources – directly associated with NASA HSPD-12 Business processes. These Business processes includes request, sponsor, verify, validate, authorize. Systems include:

IdMAX	Sun Identity Manager v8.x Microsoft SQL 2005 –	Identity Management
NED	Sun JAVA Directory 5.2 – upgrading to 6.3	Data Repository
BAS	Aware BWP v5.1.5 update1	Biometrics Repository
URC	Aware URC version 1.0.2711.24356	Identity Verification – Enrollment
CMS	ActiveIdentity CMS v4.1 BN51	Card Production, Encoding and Finalization
BMS	ActiveIdentity BMS v2.7.0.15 build 15	Card Production
EPACS	Lenel OnGuard 6.1.222	Card Production – Physical Access

The credentials that are created through this process are managed via this portion of the ICAM architecture. Currently the agency credentials are PIV II; however the agency is integrating other credentials such as RSA Tokens and Temporary Worker. There are several center unique credentials that are produced and managed using the EPACS Lenel OnGuard implementation.

**Access Management**

Access Management allows usage of NASA authorized identities to access NASA Logical and Physical resources. After an identity has been created in the Identity Management system, then authorized in the Credential Management System, the user can be granted access to approved logical and physical resources.

**Logical Access****NASA Account Management System (NAMS)**

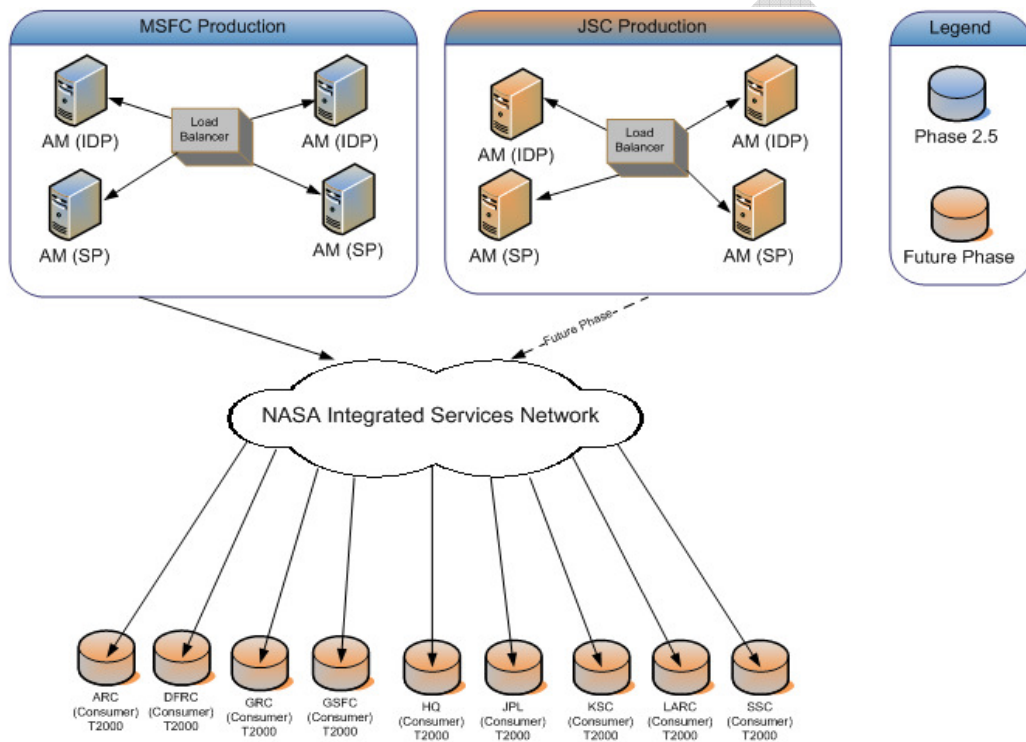
NAMS is the agency process for requesting, approving and provisioning of access to NASA's logical resources. Currently, there are over 500 applications integrated into NAMS, with an additional 2000 expected in the next year. NAMS is a custom built application using the Identity Management architecture. There are several additional tools used to support NAMS processes. These included reconsolidation of accounts, account request tracking, account revalidation and account closure.



## Attachment L-B - Background and Historical

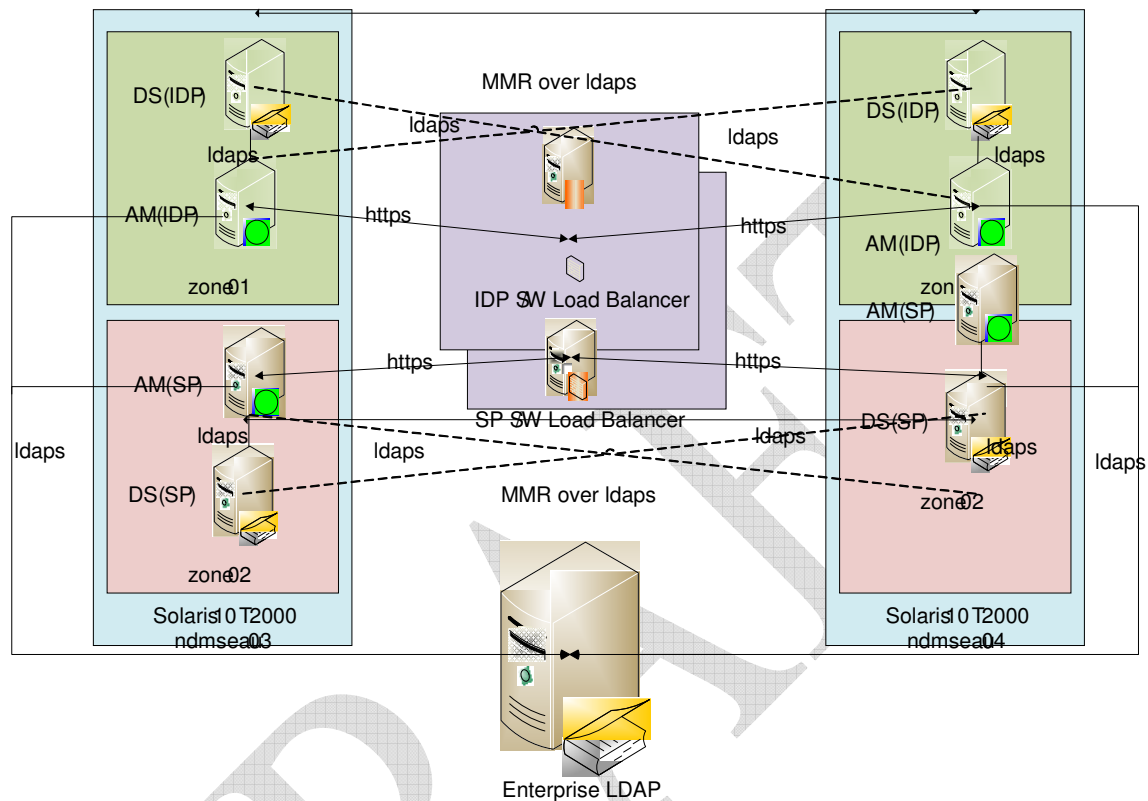
**e-Authentication (eAuth)**

e-Auth is an OMB e-Gov directive for authentication across several lines of government business. Sun Access Manager is the product implemented at NASA to support the e-Gov initiative and internal authentication within NASA web enabled applications. This is a custom configuration to support authentication using NED, NCAD and the Online Certificate Status Protocol (OCSP) architectures depending on the application specifics. The NEACC provides centralized management, while the hardware is located at the NASA centers to support their application requirements. See Figure 7, *e-Authentication Physical Architecture* and Figure 8, *e-Authentication High Level Architecture*.



**Figure 7 - e-Authentication Physical Architecture**

## Attachment L-B - Background and Historical



**Figure 8 - e-Authentication High Level Architecture**

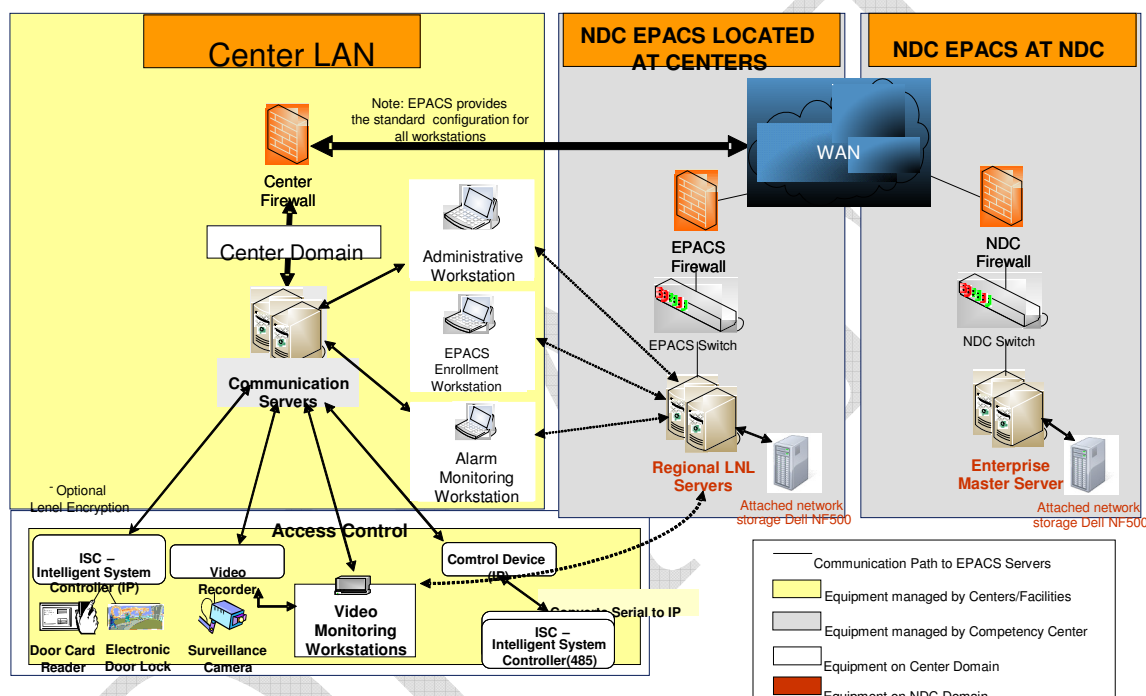
Agency Launch Pad is a project currently underway to expand the current configuration of e-Auth. This expansion will include providing initial password, Agency userid and authentication questions for the first time user experience. This upgrade will also include help desk and maintenance tools for these services. The implementation is scheduled for Summer 2009.

## Attachment L-B - Background and Historical

**Physical Access****Enterprise Physical Access System (EPACS)**

EPACS is the agency infrastructure providing a common NASA enterprise physical access control system that secures all NASA facilities, personnel and assets. EPACS controls physical access to any facility at each Center. The approved identity information is pushed from the Identity systems to the EPACS system for granting of physical access. The EPACS system is a Commercial off the shelf (COTS) implementation using Lenel OnGuard software.

The centralized and decentralized components of the EPACS hardware are described in Figure 9, *EPACS Physical Architecture*.



**Figure 9 - EPACS Physical Architecture**

Currently, there are seventeen regional implementations, which are located at NASA Centers and Facilities. These include: Ames Research Center (ARC), Dryden Flight Research Center (DFRC), Glenn Research Center (GRC), Goddard Space Flight Center (GSFC), Headquarters (HQ), Jet Propulsion Laboratory (JPL), Johnson Space Center (JSC), Kennedy Space Center (KSC), Langley Research Center (LaRC), Michoud Assembly Facility (MAF), Marshall Space Flight Center (MSFC), Stennis Space Center (SSC), Wallops Flight Facility (WFF), White Sands Test Complex (WSC), White Sands Test Facility (WSTF), Central Region (CR) and Enterprise Master (EM). The Central Region and Enterprise Master implementations are located in the MSFC NASA Data Center (NDC). Figure 10, *EPACS Logical Architecture* displays the same information in a logical view format.

## Attachment L-B - Background and Historical

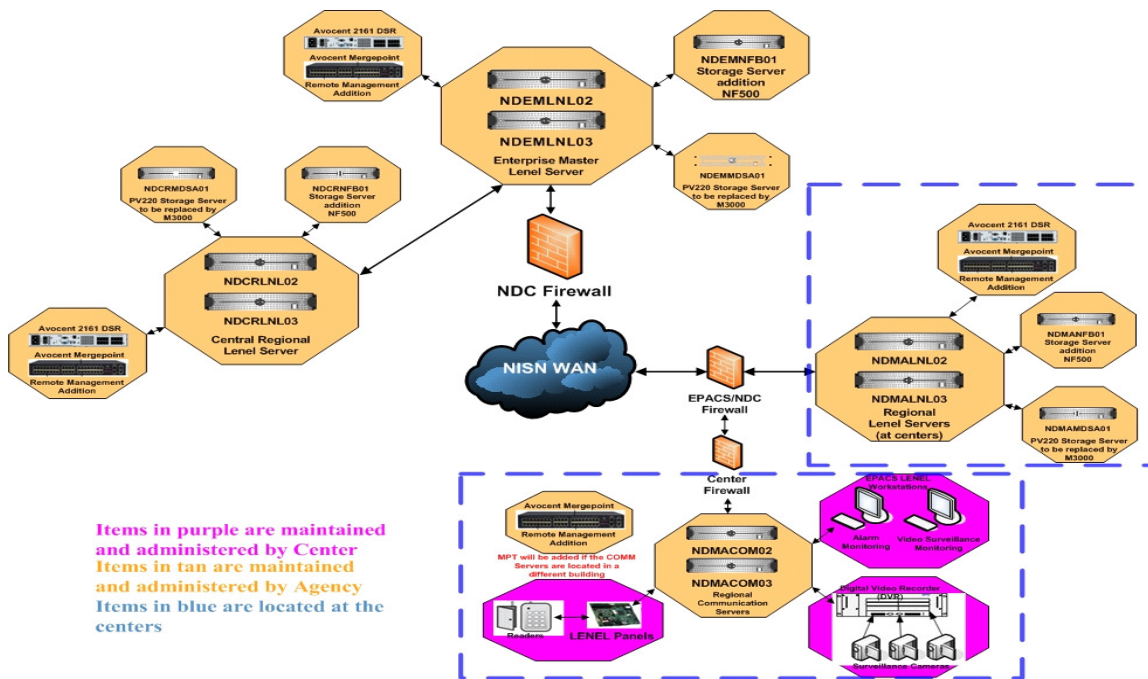
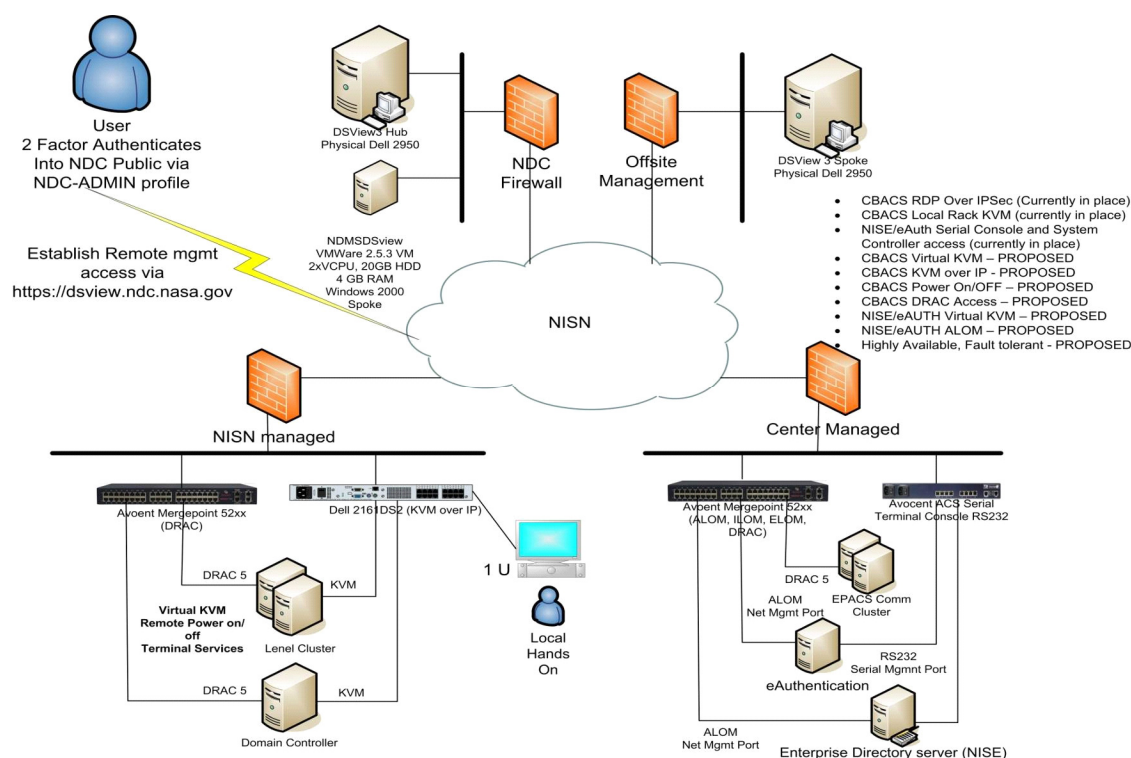


Figure 10 – EPACS Logical Architecture

The supporting infrastructure implemented for managing EPACS is documented in Figure 11, *EPACS Logical Architecture Remote Management Framework*.

## Attachment L-B - Background and Historical



**Figure 11 – EPACS Logical Architecture Remote Management Framework**

The EPACS hardware is currently being refreshed with an expected completion by June 2009. When the hardware refresh has been completed, an upgrade of the Lenel OnGuard software is planned. The Lenel OnGuard software upgrade is scheduled to be completed before the end of calendar year 2009.

### 3.2.6 Product Lifecycle Management (PLM) Line of Business

Note: PLM is currently managed under the UNITeS contract, but is not incorporated into the NEACC Lines of Business. PLM therefore represents new scope that will be added to NEACC as a new Line of Business with the start-up of the EAST contract.

#### 3.2.6.1 Integrated Collaboration Environment (ICE) Overview

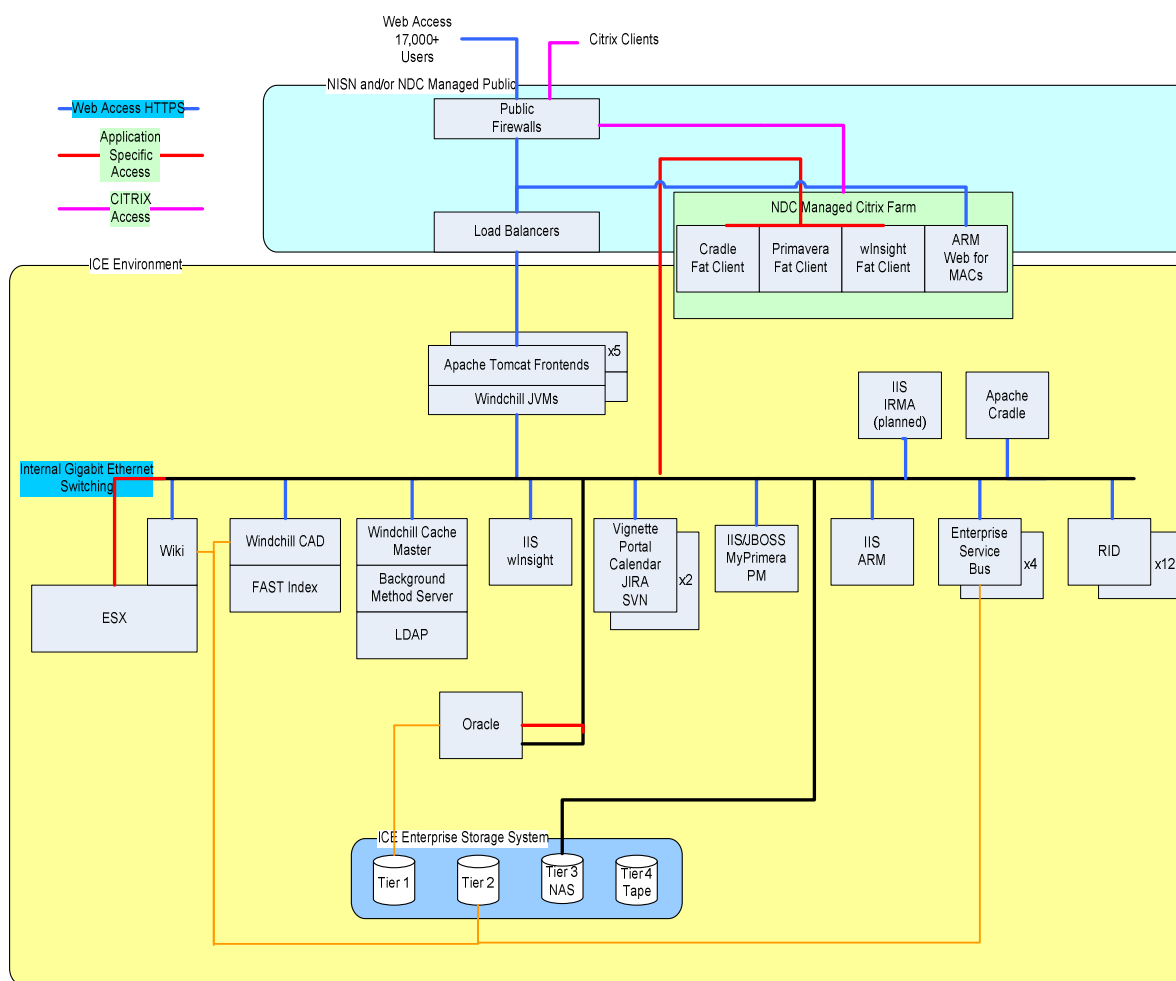
##### System Description

ICE is a web centric suite of applications accessed and used by approximately 17,000 users. ICE is designed for use by industry, academia and government for: sharing, collaborating, integrating, accessing and controlling management information and product data defining all of the products which are part of Exploration Systems.

## Attachment L-B - Background and Historical

The ICE architecture includes a load balanced front end with multiple redundant web servers. All ICE applications are accessed through Apache reverse proxy web service and require user and service authentication. Where supported, ICE applications also employ clustering across multiple servers at the application level. Standardized high performance server configurations designed for high availability are deployed with features such as dual redundant power supplies connected to two PDUs with independent power feeds. Data storage requirements are met with Tier 1, Tier 2, Tier 3 storage as required.

The following diagram illustrates the multi-tier architecture of ICE:



**Figure 12 – ICE Multi-tier Architecture**

## Attachment L-B - Background and Historical

The ICE is currently designed and implemented to provide a suite of integrated application services that provide capabilities in the following areas:

- Product Data Management
- Project Management
- Collaboration (structured and unstructured)
- Scheduling
- Earned Value Management
- Risk Management
- Requirements Management
- Application and Business Process Integration via Enterprise Service Bus

The ICE project supports a 24x7 production operation only affected by power and network connectivity. Its architecture is expandable vertically and horizontally with new hardware and software technologies as required.

### **ICE Applications**

Major systems:

- Cradle – Requirements Management System
- Windchill – Product Life Cycle Management and Document Management
- Primavera – Project and Earned Value Management System
- Aphelion LDAP – Embedded LDAP server for Windchill, but functions as the security policy server
- ARM – Level 1 Risk Management System
- IRMA – Level 2 Risk Management System used for specific projects such as the Constellation program
- wIsight – Earned Value System
- Vignette – Document Management and Portal services
- Wiki – Confluence Wiki

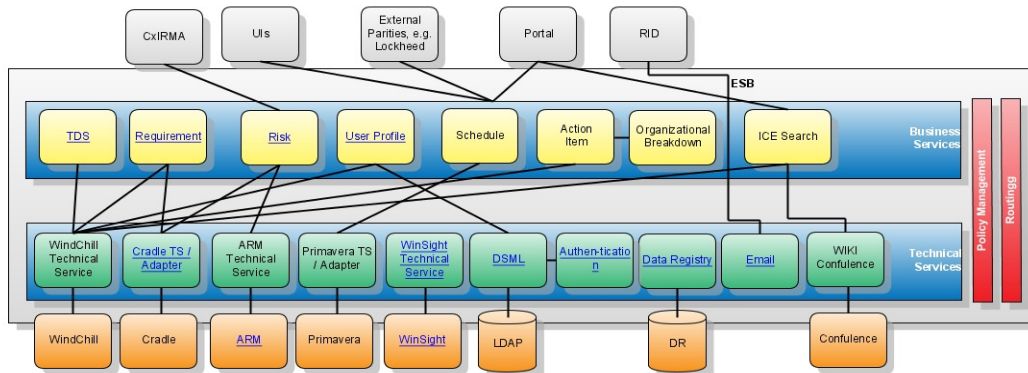
### **ICE Enterprise Service Bus (ESB)**

NASA ICE ESB Architecture is based on the principles of a Service Oriented Architecture (SOA). The ICE Collaborative Service Environment provides loosely coupled business service, business process services, and technical services that enable the collaboration with the different disciplines within the ICE environment. The services enable ICE systems as well as remotely located non-ICE systems to access data and functions from authoritative sources, as such reducing data duplication and providing real-time information through the use of events. The ICE ESB is the conduit for all data transfer, service call messages, and event services, thus ensuring that all usage is logged, monitored and controlled.



## Attachment L-B - Background and Historical

The following diagrams shows the current exposed services.



**Figure 13 – ICE ESB Architecture**

### ICE Concept of Operations

ICE is located in the NASA Data Center (NDC) in MSFC Building 4663. The configuration consists of approximately seventy Sun Microsystems servers running the Solaris operating system and ten MS Windows servers. These servers are housed in the NDC in fifteen equipment racks with supporting infrastructure that includes network switches, load balancers, monitors and keyboard/video/mouse (KVM) switches.

ICE Operations depends upon services provided by the NDC, ICE Operations Team, and the NASA Information Support Network (NISN)

#### NDC Services:

ICE is located within the NDC under a fee for service “housing” arrangement. The NDC provides infrastructure that includes:

- Uninterruptible Power
- HVAC
- Raised floor space
- 24x7 DataCenter Operations
- Citrix Hosting Services

The NDC provides a facility with dual redundant power feeds into multiple Uninterruptible Power Supplies backed up by motor generators. These power features support the servers and HVAC equipment. The datacenter is in a controlled access area in a controlled access building



## Attachment L-B - Background and Historical

surrounded by protective bollards. The interior of the datacenter is visually monitored 24x7 by personnel at the NASA Information Support Center (NISC).

NISN Services

The NASA Information Services Network provides Wide Area and Local Area Network services for the ICE systems. These services include:

- External Switched Infrastructure Management
- Load Balancer Management
- Firewall Management
- PIP/SIP Network Interfaces to Centers
- WAN Services
- 24x7 Network Operations

ICE Operations:

The UNITEs contract provides labor for the following functions supporting ICE Operations.

- Tier 1, 2 and 3 Help Desk
- Training
- IT Security Support
- Server Administration
- Application Administration
- Database Administration
- Hardware Maintenance
- Software, hardware and service procurement
- IT Engineering Services
- Application Integration Development

ICE Managed Environments:

The ICE configuration consists of four distinct environments: production, staging, integration and development. These four environments support the entire software and product development lifecycle. Application changes that have no dependencies on other ICE applications are typically developed at remote locations and delivered to the ICE Application Admin team for installation in the integration environment. There they undergo regression testing. ICE employs a team of test engineers that perform this function using a combination of manual test scripts and tools from Mercury Inc. and Quality Center. Following successful regression testing the application changes are installed in the staging environment for performance testing. The staging environment closely mirrors the production configuration and is loaded with a recent copy of production data. Following successful performance testing the changes are scheduled for deployment in the ICE production environment. An NDC Change Request is submitted to document the configuration change and receive approval for implementation. An NDC Activity Request is then submitted to schedule the deployment.

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ICE Active Monitoring

ICE systems are actively monitored via the the ICE Active Monitoring System (IAMS). This is a customized implementation of open source tools (Nagios) that provide near realtime indications of server and application health with web, email and audio alerts on predefined thresholds. IAMS also collects performance trend data for use in monthly capacity planning activities.

Backup and Vaulting

ICE systems and data storage is backed up to Tier 4 tape storage on a regular schedule and stored offsite in an approved vault. Further information on ICE backups can be found in the ESMD ICE Media Management Plan.

**3.2.7 Business Intelligence (BI) Line of Business**

Prior to the advent of the IEMP Program, NASA depended on each of the ten centers to fulfill their own reporting needs. This decentralized approach sometimes resulted in inconsistent reporting and differing views of the specific reporting requirement. NASA HQ, in order to answer an Agency-wide data call, had to consolidate centers input to create an agency-wide report. Also, centers had to request data from other centers if a program/project managed at one center required work to be done at another center. Centers had varying degrees of success in providing center reporting. Some centers had more resources and tools to answer questions and overall a variety of tools was supported. With each tool supported, centers had to maintain a reporting environment. As a result, duplicative effort was required at each center and significant resources were required at each center to maintain the environments.

Centralization of center reporting was not an easy task to consolidate. NASA went through two projects, one on the mainframe and one utilizing a newly developed server product, that were not successful for the Agency. From both of these experiences, lessons learned contributed to the selection of SAP as a mature and proven integrated solution. By choosing SAP, and devoting the necessary resources, NASA chose a product that has been successful in the private sector. From a reporting perspective, one of the basic tenets was to develop an integrated Enterprise Data Warehouse (EDW) and integrate new lines of business into the EDW. SAP's Business Warehouse (BW) was chosen to provide the underlying data warehouse architecture and technology to support the EDW. The EDW continues to expand from its initial Core Financial roots, integrating additional Procurement, Travel, Logistics and Human Capital solutions to provide reporting across the Agency's business systems for varying user needs.

The establishment of the NEACC centralized reporting efforts and consolidated the data into one Agency-wide environment. This allowed the centers to see data across the Agency, thereby eliminating the previous program/project restrictions. The NEACC maintains a core set of reporting tools and delivers standard queries and reports to the user community. The NEACC merges functional and technical resources to provide answers to business related questions. Data

## Attachment L-B - Background and Historical

is still available to the centers to incorporate in center specific systems; however, this is the exception rather than the norm. The NEACC continues to add additional data, queries and reports, and continues to advance the architecture supporting the business systems.

### **3.2.7.1 Lines of Business – Business Intelligence Support**

The initial SAP rollout started with the Core Financial area at the beginning of fiscal year 2003 (October, 2002). The transactional system (R/3) rollout was accomplished in three waves so that all centers were incorporated over time. Core Financial Reporting using SAP's BW started in December, 2002 and each successive wave's data was incorporated into the centralized data repository. The SAP Core Financial reporting provided reporting in the areas of Finance, Purchasing, Accounts Payable/Accounts Receivable, and Standard General Ledger. In addition, data was incorporated from the GELCO Travel Manager system. Over time, the Core Financial area has been updated via separate projects (Project Management Information Improvement (PMII) and SAP Version Update (SVU)) to provide additional financial tracking capabilities. Agency Labor Distribution System (ALDS) data has also been incorporated into the Core Financial model.

New business areas are also being addressed. Procurement needs, satisfied through the transactional system PRISMS, has been incorporated into BW. Logistics needs are being incorporated into BW and asset management and disposal reporting is being provided. Human Capital Information Environment (HCIE) needs are being incorporated into BW.

Over time, the lines of business have taken on differing "look and feel" depending on the line of business implementation. In some cases, even though web enabled, transactions systems access is segregated from reporting access, integrated with a portal, or integrated with a different portal. Typical security in BW allows access to all non-PAI data across the Agency, but security is in place for some queries/reports to safeguard sensitive data as required.

### **3.2.7.2 Evolution of Business Intelligence Tools**

Initially, since SAP was the solution for the transactional entry of data, SAP's BW was chosen as the reporting component. BW is not just the visual reporting component, but includes the functionality to: capture "delta" change information from the transactional systems, extract/transform/load delta data through nightly processes, and develop reporting multi-dimensional cubes that can be integrated for more analytical review of data. The initial reporting was designed for the analysts so that they could take a query and manipulate the default layout to answer additional information requests with the same query. BW, over the years, has expanded their product and NASA has continued to evolve from BW 3.0 to its current version of BI 7.0. The evolution of BW has provided new functionality and integrated common components from the reporting and portal sides. The latest upgrade to BI 7.0 provides the base NetWeaver architecture that SAP has built upon to incorporate new functional capabilities.

## Attachment L-B - Background and Historical

One of the limitations associated with the initial rollout of SAP was the lack of reporting to non-analytical users. To solve this, the NEACC, along with center representatives, evaluated numerous reporting tools that would work with BW data sources. Actuate was chosen and the licenses were procured to allow both the NEACC and centers to develop queries/reports for business needs. Over time, Actuate has not been as readily accepted as hoped, and only a few centers are using this for their reporting needs. The NEACC has used Actuate for Procurement, Logistics and Human Capital, and Administrator reporting needs. Since Actuate is used primarily to report on BW data, the need for Actuate to continue to evolve through SAP's upgrades is imperative.

A new reporting tool from COGNOS (recently acquired by IBM), has emerged within the NEACC and is being used for dashboard development within the Human Capital project. The overall suite of tools from COGNOS provides a web enabled interface for dashboard development, list reporting, and ad hoc reporting. This is the NEACC's recommended tool for future reporting needs. COGNOS's suite of tools is SAP certified and in Gartner's analysis, COGNOS is a leading vendor for business reporting.

There are also other reporting tools being used by the centers against BW data. SAP provides an add-in to EXCEL that allows BW queries to be executed directly from EXCEL. This is not a supported tool by the NEACC but the usage is gaining acceptance from the centers.

There are also reporting needs to go against non-BW data. One tool, BRIO (bought by Hyperion and later Hyperion was bought by Oracle), is being used at the NEACC by a subset of the HCIE community (StaRS). This particular tool is out of date relating to software and hardware and the intent is to replace BRIO with a new reporting tool and architecture in the FY 2009 timeframe.

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Business Warehouse (BW)

The inventory of available BW queries/reports is as follows:

<b>LINE OF BUSINESS</b>	<b>BW REPORTS</b>	<b>ACTUATE OBJECTS (Information Objects + Reports)</b>	<b>COGNOS DASHBOARDS (Components)</b>
Core Financial	86	2	
Procurement	60	17	
Logistics	27	1	
Human Capital (not fully in production)	110	24	70+
Center Developed	4	18	
<b>TOTAL</b>	<b>287</b>	<b>62</b>	<b>70+</b>

**3.2.7.3 The Path Forward**

Since the BI environment is now at Release 7.0, NASA is introducing new capabilities. The first such capability is the BI Accelerator (BIA). This is generally called an “appliance,” because it integrates both hardware and software with the purpose of increasing the performance of BW queries. BIA was initially targeted at the HCIE and ALDS reporting cubes, but later rolled out to other the BW reporting areas.

From a total BI perspective, the NEACC’s reporting strategy is to drive toward a singular portal solution for accessing BI capabilities, as well as toward a common reporting tool in support of BI presentations (E.g. dashboards, formatted reporting, ad hoc reports). The goal is to reduce maintenance costs for BI platforms, while providing a consistent level of quality and a standard look and feel across all Lines of Business. Current analysis and planning is underway to address the required transitions. In addition, the NEACC will monitor the inclusion of the Business Objects toolset into SAP. This recent purchase by SAP merges two significant players in the ERP and reporting arenas. SAP’s intent is to use the Business Objects toolset going forward, but the path to get there is unclear. NASA has a significant investment in BW queries and their continued use is required.

## Attachment L-B - Background and Historical

The NEACC will continue to add new BI capabilities in support of the Lines of Business. These capabilities include additional reporting to across user bases (dashboards, ad hoc, list, etc.) as well as inclusion of additional data sources (e.g. real property in the logistics area). As with all Enterprise Applications, the Business Intelligence environment is never complete and requires continued upgrades and enhancements to leverage new technologies and meet stakeholder needs.

### **3.2.8 Enterprise Service Bus (ESB) Line of business**

Prior to the implementation of the Integrated Enterprise Management Program (IEMP) Core Financial Project, integrations that supported NASA business systems were accomplished in a point-to-point manner and primarily at the Center level. As a result, there were very few integrated business processes across the Agency. As part of the implementation of the Core Financial Project, integrations were built utilizing SeeBeyond's Enterprise Application Integration (EAI) broker, which was a first step away from point-to-point integrations. The overall IEMP strategy was to reduce the uncontrolled replication of data throughout the enterprise by seeking to keep and protect data at its source, while providing access to the data from other applications via a Services Oriented Architecture (SOA) approach.

Over the past several years, the NEACC has migrated away from propriety integration technologies toward an OpenSource solution that leverages both an Enterprise Service Bus (ESB) as well as an Extract Transform Load (ETL) broker for the majority of its process integrations. Under the EAST contract, the NEACC will also incorporate The Product Management Lifecycle, Product Data Management (PLM/PDM) Line of Business, which was originally implemented and managed outside the NEACC utilizing an ESB built on Tibco proprietary technologies. As a result, the NEACC will be responsible for continuing and expanding the use of the OpenSource ESB, while continuing to manage a set of propriety integration components.

The NEACC supports the majority of enterprise services, technical services, and system to system integrations on top of the OpenSource ESB platform. This platform is a collection of open source tools and projects that have been pulled together (and sometimes augmented) to provide a complete development, runtime, monitoring, and management toolset for NASA NEACC to support a SOA. At the center of this platform is the OpenSource ESB, which provides the runtime for all services and is built around the Java Business Integration (JBI) implementation ServiceMix.

For detailed information related to the NEACC OpenSource ESB, refer to the document entitled "NASA OpenSource ESB" located on the EAST I<sup>3</sup>P Website.

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**3.2.9 Internal Portal and Collaboration Line of Business**

During the time period spanning the UNITEs contract, the Agency did not have a consolidated approach to managing all internal portal and collaboration applications utilized within NASA. The Agency OCIO managed NASA's external facing web presence (www.nasa.gov) under the eTouch Web Services contract, as well as a subset of internal facing web applications in use across the Agency that relied on similar technologies. However, many centers and programs continue to leverage individualized capabilities in support of internal web collaboration needs.

Currently NASA has a number of Enterprise Portal solutions and interactive collaboration capabilities/services, which include team space/collaboration, internal wikis and blogs, search engines, and content management services. Additionally, NASA is in the process of gathering collaboration requirements as well as reviewing the various collaboration tool sets available with the ultimate goal of setting a standard set of collaboration tools that can be utilized across NASA both internally and externally as part of the long-term Agency Enterprise Architecture. Once a standard collaboration tool set is defined, additional consolidation may be undertaken to eliminate duplication and reduce costs.

Legacy internal facing web requirements, such as those provided via InsideNASA, will be provisioned out of the WEST contract. New internal portal and collaboration requirements will be provisioned out of the NEACC under the EAST contract. Internal Portal and Collaboration includes:

- Wikis and blogs
- Team collaboration spaces
- Other internal-use portal capabilities

**Enterprise Portals**

The NEACC supports and maintains an Enterprise Web Portal platform that utilizes Aqualogic and a common tool/skillset to render websites for the NASA Office of Human Capital Management ("Human Capital Information Environment", or "HCIE") and the NEACC's own Business Systems portal ("iView").

The HCIE portal is available to every NASA civil servant and provides workforce, payroll, and other human capital-related information at varying levels based on roles and access. Traffic on this portal is relatively low, the number and design of portlets is extensive, and performance is not yet optimized. Information is displayed via a complex set of interfaces with source systems, many of which are external to the NEACC. Some development activities are performed at other NASA Centers. Stabilization, performance optimization, and alignment with NEACC standards are the primary near-term challenges in the support of this portal. A longer-term challenge will be increasing traffic to this website. Currently, the NEACC is in the process of transferring the support and maintenance of this portal from the Johnson Space Center, where it was initially

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developed. The NEACC's Human Capital and Workforce team will assume functional management of the HCIE portal once the transition and project work are completed.

The iView portal was developed as a part of the SAP landscape to provide NEACC end-users with information and analytic. There are plans to transition iView content off of the SAP Portal and migrate it to the Aqualogic model in order to achieve efficiencies. iView, currently managed by the Business Readiness team, is accessed approximately 140,000 times by 3,500-4,000 unique user IDs in a standard month and serves as a launch pad for several applications including Core Financial, Contract Management, Business Warehouse, eBudget, WebTADs, and other systems. iView provides access to program and project documentation, news portlets, and collaboration capability. Content on this portal is very dynamic, as it is a primary communication method for information about NEACC software releases and impacts. Near-term challenges include replicating current functionality and performance on Aqualogic, while implementing an updated design and improved navigation.

### **3.2.10 Transitional NASA Data Center (NDC) Services Line of Business**

Transitional NDC Services describes a set of user-facing and support applications that were provisioned under the MSFC NDC service definition. These services will not be provisioned by the NEDC, but rather will be managed by NEACC.

#### Citrix

The user-base is primarily the NEACC financial applications and ICE (PLM). This instance of Citrix is licensed for 350 concurrent users supporting 15 applications. The Citrix application is running on ESX VMware and is configured on the NDC Public and Private networks.

There is a small footprint of NOMAD client use. NSSC uses Citrix for Cognos and EOPF and a small group of MS Project users at Ames Research Center.

#### NET IQ Application Manager

NET IQ Application Manager is a Commercial Off-The-Shelf (COTS) solution used for system and application monitoring. It was implemented in a limited way under the MSFC NDC service catalog. It primarily supports NEACC ICAM systems. The intent is to broaden the use of this tool for the NEACC applications.

#### Sharepoint 2003

This application was implemented as part of the MSFC NDC service catalog. It currently has 98 team sites. It has been managed by the UNITES MSFC application group. This application is slated to become absorbed into the Agency SharePoint 2007 implementation.



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Brio

BRIO is a legacy NDC reporting solution. It is primarily used by the NEACC StARs application. It is also used in a limited manner by other applications.

ADOSS

Agency-wide Digital Optical Storage Solution (ADOSS) is a legacy data storage capability. It is primarily used by the NEACC Human Capital and Workforce Line of Business.

MS SQL Enterprise Cluster

This is a legacy MSFC NDC capability. It was not sold as a service but was provisioned to several key Agency applications. These include eBudget, Primavera, NetIQ App Manager, NetIQ Security Manager (used for ICAM), NISE, CBACS, Aqualogic Portal. There are over 400 MS SQL instances in this environment which require sorting out and placing under configuration management within the appropriate delivery framework. NEACC will manage the normalization of this platform.

#### **4 APPLICATION IMPLEMENTATION – SOFTWARE ENGINEERING TASKS**

With the completion of the IEM Program, the era of large-scale application implementation projects that span multiple years and replace large swaths of non-integrated legacy systems has come to a close. However, the evolving requirements of the Agency, coupled with continual advances in IT technologies, business automation tools, and collaborative solutions, all indicate that there will be a continuing need for the NEACC to implement new software features, applications, and platforms. As with other organizations that have the opportunity to look back over the systems and processes implemented during the Enterprise Resource Planning (ERP) era of the late Twentieth and early Twenty-First century, NASA has also learned more about the pros and cons of choices made during the ERP implementation. Armed with this experience and knowledge, the Agency is examining the benefits of investing in changes and improvements to its core set of business applications.

Examples of activities currently under consideration that could be handled as ID/IQ Task Orders under the EAST contract include the following:

- Management / Business Systems Integration Group (M/BSIG) Gap Analysis and Concept Work:
  - The Agency has identified a set of business process gaps within the current Business Systems solution set. A gap entails missing functionality or the inability of the current systems to support required Agency business processes
- New Social Networking / Team Collaboration Solutions
- Mobile access to existing NEACC applications
- Consolidation of Agency Product Lifecycle Management systems
- Enterprise RSA Token implementation and operations
- Extension of NEACC Enterprise Service Bus to broader application set

Over the past three years, the NEACC has transitioned from a waterfall-based Application Implementation approach to an incremental, Agile framework for Application Implementation initiatives. The Agile, or iterative, approach has proven to be better suited to the Agency's environment, where requirements are complex and dynamic, and where a high degree of user and stakeholder participation throughout the development process is a key factor for success.

## **5 DELIVERY FUNCTIONS**

### **5.1 Factory Management**

Factory Management refers to a set of interrelated Delivery Sub-Functions that are critical to ensuring the NEACC factory is operating at the required performance and quality levels.

#### **5.1.1 Service Level Management**

Service Level Management (SLM) is responsible for performing all tasks required to ensure that both NASA's expected levels of performance, as well as the End User Customer's overall expectations, are continually met. Service Level Management defines and oversees the Service Level processes that are used within the NEACC factory, establishes guidelines for assigning and reviewing service request Severity Levels, and manages the collection of data required to report performance levels to NASA

Day in the life of NEACC Service Level Management:

- Compose and Distribute Event Communications
- Compose Weekly Notes
- Customer Satisfaction (Pending Closure SR) Support
- Daily update of SAP Report
- NEACC Documentation Management
- NEACC Escalation Process Facilitator
- Facilitate and Manage Daily Service Review
- Facilitate NEACC Team Service Request management
- Generate Managers Daily Activity Report
- Generate, Review, Distribute NEACC Weekly Activities Report
- NEACC representative for MSFC International Organization for Standardization (ISO) re-certification
- Manage NEACC Distribution Lists
- Manage Remedy accounts
- Manage NEACC Systems Outage Calendar
- Metrics Compilation and Distribution
- New Employee SATERN & Account Support
- Facilitate Incident and Problem Resolution
- Conduct Risk management meetings (2x/month)
- Schedule and Conduct Root Cause Analysis
- Record online meetings (telecons)
- Schedule and initialize Webex sessions

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- Service Restoration Team Facilitator
- Statistics Generation
- Support NEACC Mailbox Customer Inquiries
- Conduct Internal NEACC Training (Remedy, SRT, RCA, Escalation)
- Update i-VIEW Alert Messages

Currently the NEACC has many Service Level Agreements in place between the NEACC and its various stakeholder communities. The current set of SLAs can be viewed on the I<sup>3</sup>P EAST website at <http://ec.msfc.nasa.gov/apt/portal/acqDetails.php?acqNum=2>. Under the EAST contract, the Contractor will be responsible for performing to the Service Level Standards defined in Attachment **J-4**, *Service Level Standards*, while NEACC Management will retain authority for managing all SLAs with NEACC customers.

## Capacity Management

Beginning in 2007, NEACC management designated Capacity Management as a strategic focus area for attention and improvement. Historically, the NEACC has found it challenging to precisely quantify the total resource capacity available for a given release or a given timeframe. The NEACC management's goal has been to encourage a standard, reliable Capacity Management process that can be used to understand how much output can be expected and to communicate that expectation to stakeholders and Program Managers.

### Background

Over the course of time, the NEACC has gradually moved away from project work to more of an operations and sustaining support (O&SS) model and with that transition the necessity to understand better what the capacity is both in terms of infrastructure and personnel resources has become increasingly more important. The following Wikipedia definition is provided to ensure a clear understanding of what is meant by capacity planning:

“Capacity planning is the process of determining the production capacity needed by an organization to meet changing demands for its products. In the context of capacity planning, "capacity" is the maximum amount of work that an organization is capable of completing in a given period of time. A discrepancy between the capacity of an organization and the demands of its customers results in inefficiency, either in under-utilized resources or unfulfilled customers. The goal of capacity planning is to minimize this discrepancy.”

### Introduction

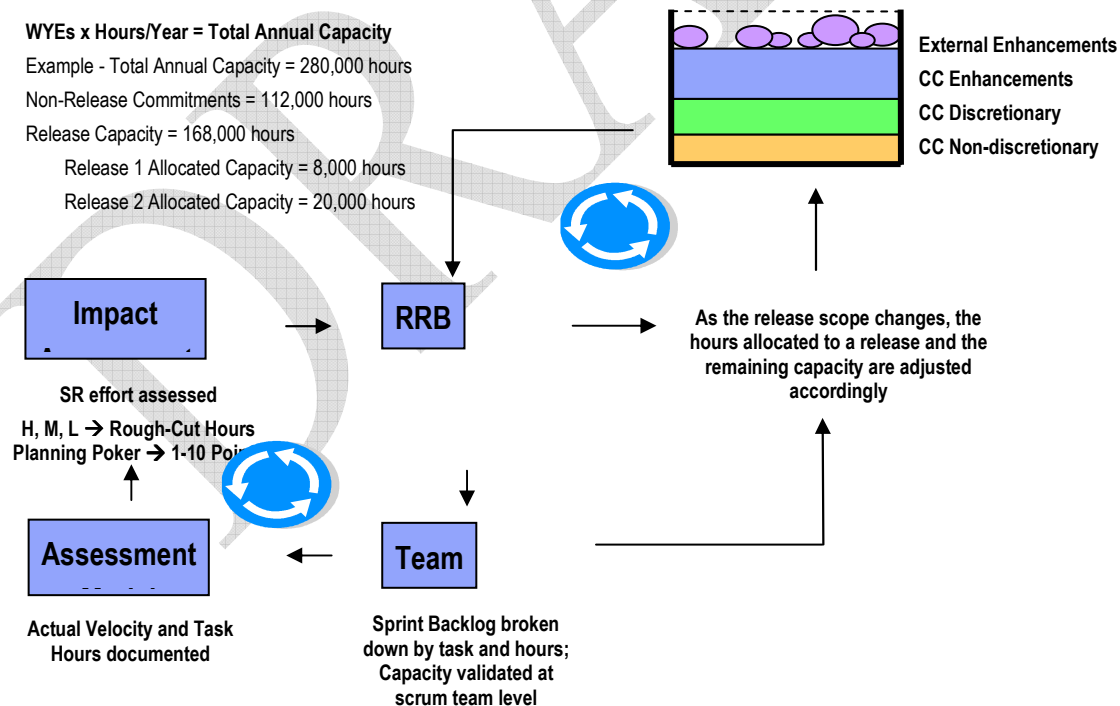
Capacity and Release Planning are interrelated. Release Planning defines what content will be in the Release, but falls short in addressing the capacity needed to deliver the content while maintaining operational commitment levels. There is a limit to the scope that can be delivered

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within each individual release, the release content is determined based on business value and other weighting factors. The Release Review Board (RRB) serves as a high level, cross-organizational body that reviews inputs of all functional and technical governance forums to ensure that the release content determination is based on a cross-organizational view that examines proposed changes from a broad, rather than a stove-piped, perspective.

When considering Capacity, there are three organizational levels from which to view capacity (i.e., overall NEACC capacity, capacity by Delivery Function, capacity by an Agile/Scrum team).

Capacity can be summarized as supply and demand equation. The primary benefits of Capacity Management are that it involves a forward-looking process that ensures that the future business requirements for the NEACC's services are considered and understood and that sufficient capacity is available to support the services is planned and implemented in an appropriate timescale. Additionally, a good Capacity Management process provides the necessary information on current and planned resource utilization of NEACC teams and it will take into account the overall capacity of the NEACC to address the various demand requests (i.e., enhancements, discretionary and non-discretionary). To show the complete capacity supply and demand equation, Capacity management (i.e., supply) must be integrated with the Project/Release management and the Task Tracking (i.e., demand). The following diagram depicts the NEACC Capacity Management process:



**Figure 14: Capacity Management Process**

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### 5.1.2 Release Management

The NEACC utilizes a Release Management approach to bundle changes to existing applications and to ensure delivery of these changes safely into production environments. The Release Management approach seeks to minimize the frequency of large, disruptive changes while providing end users with a steady flow of incremental repairs and improvements that enhance their experience. Release content is based on Governance processes—as described in Section 1.2.3 of this document—that determine priorities of individual change items. The Release process also relies on Capacity Management processes—as described in Section 5.1.2 of this document—that determine the volume of work that can be performed in a given time period.

The Release Management approach must be flexible enough to seamlessly incorporate the increasing number of applications supported by the NEACC. This effort is often subjected to short implementation timeframes and limited resources; therefore communication across the various Lines of business and the delivery functions is fundamental to success. Implementation of a release across all components of the NEACC production landscape requires extensive collaboration and teamwork both internal to the NEACC as well as with the Agency stakeholders.

The Release Management team must demonstrate the following Knowledge, Skills and Attributes:

- Ability to ensure configuration controls are maintained
- Excellent communication skills and customer relationship management required
- Skill in planning and prioritization of work assignments.
- Skill in effectively managing day-to-day coordination activities
- Ability to apply technical knowledge to effectively plan and coordinate software releases

#### Release Management Duties

- Understand scope for a specific release, which involves understanding cross-project, cross-application, technical and external impacts, dependencies, and integration touch points and ensuring those are communicated and managed throughout the release
- Understand testing required for a specific release, both content of testing and test passes/durations required
- Understand the landscape requirements needed to support the overall release development and testing environments, including specific project requirements
- Determine how, and when, projects will enter the promote to production landscape, both development and testing environments
- Work with the Applications Technical Operations and Maintenance (ATOM) team to develop landscape infrastructure plan to support the release development, testing and deployment for appropriate applications, as well as any special rules of engagement or updates to NEACC support tools for the release
- Maintain NEACC Integrated Landscape view to specifying hardware, database & software patch levels, code base, integration touch points, and owners

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- Ensure the NEACC Integrated Landscape maintains its consistency, i.e., refreshes, migrations, transports, patches, and other technical configuration are propagated appropriately and timely throughout the integrated landscape
- For larger releases, develop and manage release cutover plan detailing specific tasks needed to support release and environment builds; Ensure cutover plan is used for each test pass and is consistent across test passes, replicating the production cutover as closely as possible
- Assist in developing contingency plans related to significant issues that could arise with the release
- Ensure project teams' project plans are synced up with overall release testing and cutover plans
- Coordinate and manage transports/build lists for the release to ensure only items related to the approved release scope are migrated to the release test environments
- Support RRB and MRB meetings and help to work any discrepancies or questions that arise from those meetings
- Work with ATOM team to understand upcoming build and maintenance activities to ensure those are timed appropriately around release development and testing plans
- Help to manage communications to NEACC teams about release plans
- Maintain NEACC backlog of items targeted for future release

For a detailed account of the current NEACC Release Management process, refer to the document "NEACC ERM Plan" located on the I<sup>3</sup>P EAST website at <http://ec.msfc.nasa.gov/apt/portal/acqDetails.php?acqNum=2>.

### Business Readiness (BR)

The NEACC currently has a BR organization that is aligned with the NEACC's Business Readiness Manager (IS01). The BR Manager is responsible for management and oversight of all activities in the area of BR, which includes customer relationship management, strategic and operational communications, end user documentation and support, and the administration of the supporting tools for those activities. The BR Manager is the functional owner of the Internal Portal and Collaboration line of business; is a voting member of the Release Review Board, the SAP Governance Board, the Cross-Functional Integration Working Group; and serves as a non-voting member of the M/BSIG. The BR team supports all NEACC Lines of Business.

The BR Approach Document describes the process and tools with which the NEACC analyzes the end user impacts of any changes implemented to applications and access. The tools are a set of matrices which help to identify impacts, assess their level of severity, and determine the appropriate mitigating actions. A data dictionary accompanies the matrices to ensure consistent understanding and application.

The BR team is responsible for leading the annual updates to the document and tools, through a collaborative effort with Center representatives.

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The application of the BR Approach entails the analysis of impacts of all monthly and semi-annual NEACC releases, including any projects within those releases. The analysis begins with a description of impacts by the functional or technical team primarily responsible for area being changed. The BR team ensures that all applicable SRs in a release (i.e., those with end-user impacts) have such an impact description attached. The BR team performs the impact analysis using the BR Approach tools in interviews with the functional and technical teams involved. The BR team ensures the timely execution (by the BR team and/or Centers as appropriate) of mitigation activities indicated by the analysis, packages the impact descriptions for review with the NASA business community, hosts the reviews, and ensures the review materials are distributed via email and made available via the iView portal. For semi-annual releases, the impacts are then prioritized according to the number of users impacted and the extent to which their jobs or processes are changing, and core messages are developed and distributed across the NASA business community and to senior Agency management.

As change requests are processed through Remedy, the BR team provides assessments of the effort required to update or create end user documentation. The execution of that work may be entirely the responsibility of the BR team or may be done jointly with the functional or technical teams. In some areas, the BR team has attained a level of subject matter expertise through project or scrum efforts to enable them to handle most of the documentation. It is management's expectation that the BR team will continue to grow its expertise in all lines of business supported to enable this level of support. For that reason, a BR team member is assigned at least on a part-time basis to each project/scrum/initiative. The BR team member may function as a scrum master and/or tester in order to add value to the effort while gaining the necessary expertise, as well as continually assessing and communicating the BR impacts and developing end user documentation.

The tools utilized in end user documentation creation and management are the Enterprise Performance Support System (EPSS), the System for Administration, Training, and Educational Resources for NASA (SATERN) system (maintained by the NSSC), and various training development tools such as Adobe. The BR team members are expected to be expert at maintenance and use of these tools and systems. In EPSS, the team creates and maintains the structure and organization of End User Procedures (EUPs) and Job Aids (JAs), packages new and updated documents for weekly releases, validates the results, and ensures that the content is consistent and complete. In SATERN, the team manages the IEMP discipline which houses the Competency Center's curriculum of training materials, both web-based and instructor-led. The team develops, edits and publishes those courses to SATERN and makes them available to Centers.

Service requests related to the iView portal (for content, master data, access and management of collaboration rooms) and EPSS (structure management) are the responsibility of the BR team. In addition, any updates or upgrades to those systems require work from the BR team in defining requirements, assisting in design, testing, and providing end user support and communication. Business Readiness work is tracked and documented in the Remedy system.



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In order to provide consistency and ensure completeness of communications, the BR team organizes and/or leads all Operational Support telecons, Business Readiness Network telecons, test readiness reviews and decisional checkpoints for releases; and reviews/approves all service level messages.

Other duties performed by the BR team include risk management, schedule management, performance reporting, measurement of customer satisfaction, and organizational change management (within the NEACC itself).

### **5.1.3 Quality Assurance (QA)**

Applications QA describes a set of reliable processes that form the underpinning of all Application Operations and Application Implementation services. The NEACC QA Program, which has sought to establish guidelines and procedures that cover all aspects of the Enterprise Application Lifecycle, is comprised of the following major service areas:

#### **Solution Architecture**

- Responsible for understanding and creating high level design of overall system.
- Responsible for ensuring overall pieces fit together cohesively (screens, interfaces, reports).
- Coordinates functional and technical resources assigned to that project.
- Supports project activities from “cradle to grave”.

#### **Business Analysis**

- Clearly articulate and identify customer needs by gaining an in-depth understanding of business processes.
- Assist with solution development which addresses process and system gaps across existing functional communities.

#### **Agile Project Management / Scrum Process Support**

- Maintain subject matter excellence in the practice of Scrum and Agile Project Management, including recruiting and retention of highly qualified Scrum Masters.
- Support Scrum teams where applicable with all aspects of the Scrum process, providing training where necessary.

#### **Requirements Management**

- Provide tools, framework, and systems management to support the collection, traceability, and testing coverage of business requirements.

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- Provide audit support where required.
- Utilizes both RequisitePro and Quality Center for managing and tracking requirements

**Functional Testing Support**

- Provides resources to organize, track, and report testing results for each testing cycle.
- Assists the functional testing organization by loading test plans and providing testing metrics.
- Utilizes Quality Center as the NEACC Test Management tool

**Automated Testing**

- Provides software solutions and resources to assist in the creation and execution of automated test scripts in order to reduce the overall testing cycle both in time and level of effort.
- Provides support for on-going regression testing efforts using automated test scripts.
- Utilizes Quick Test Pro and Quality Center for automated scripts

**Business Process Modeling**

- Provides support for the creation and maintenance of swim lane workflow models of business processes, utilizing Business Process Modeling toolsets.

**QA Process Support**

- Process and accept new documentation, update existing documentation, create new test plans in Quality Center, and update existing test plans in relation to SR's.

The ultimate goal of the QA program is to contribute to the delivery of application solutions that meet the needs of the business, are satisfying to the End-User, and are cost-effective to maintain. The NEACC has found that Agile-based Software Engineering and Project Management frameworks, such as Agile Scrum, can significantly contribute to improved application acceptance and quality levels. The QA team has taken on a leading role in promoting the use of Scrum. Many of the UNITEs QA team members have completed Certified Scrum Master training, and the QA team generally provides a dedicated Scrum Master for every Scrum-based initiative.

Some key tenets of the Agile Scrum framework that are supported by the QA team include:

- Iterative, time-boxed approach that emphasizes the delivery of completed application features in smaller releases
- Designation of a dedicated, knowledgeable Product Owner to own, prioritize, and manage business requirements

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- Use of small, cross-functional, self-managed teams
- Emphasis on early identification of all obstacles to progress and concentrated effort to remove obstacles
- Frequent, formal mechanisms for demonstrating completed application features to users and stakeholders and for collecting feedback
- Capturing requirements as user stories
- Applying Agile estimating techniques, such as story points
- Use of retrospectives and other mechanisms to facilitate continuous improvement of team performance

The NEACC has achieved quantifiable successes utilizing the Agile Scrum approach. Areas where improvements are still sought, and where the QA team can contribute, include:

- Increased usage of automated testing
- Greater shift towards test-driven development practices
- Improved techniques and tools for managing User Story-based requirements
- Improved Product Backlog management

The QA team has also been responsible for documenting quality-related processes, including Requirements Management procedures, Test Management procedures, and documentation standards.

#### Requirements Management

The NEACC has gone through a continuous process of evolution in its Requirements Management processes. Requirements for the original Core Financial project were maintained in a custom-built Lotus Notes Requirements Management tool. Following the implementation of Core Financial, requirements were re-validated and housed in conjunction with Use Case documents in RequisitePro. The NEACC now uses Hewlett Packard Quality Center as the central repository of application requirements. Typically, each application and / or project is comprised of a hierarchical set of requirement levels. All requirement levels are stored and linked in Quality Center. The lowest levels of requirement are also linked to test scripts.

Historical use case documentation, along with associated requirements, is stored within a document repository.

#### Business Process Modeling

The NEACC has utilized the MetaStorm ProVision (currently version 6.0.2) Business Process Modeling toolset to document business process workflows in swim lane format. There has generally been a heavy emphasis on developing workflow models during the design phase of new applications, or in support of major enhancements to existing capabilities. There has been

## Attachment L-B - Background and Historical

less of an emphasis on maintaining workflow models over time. Workflow models are typically used internally by project teams within the NEACC and are not published externally or incorporated into end-user documentation.

### Test Management

The NEACC Test Management tool has become a central component within the overall Change Management and Release Management processes utilized within the NEACC. The NEACC uses Hewlett Packard Quality Center as its central Test Management tool. The NEACC runs Quality Center version 9.2, with plans to upgrade to version 10 sometime during 2009. While the majority of NEACC Lines of Business utilize Quality Center, Lines of Business that are new or recent additions to NEACC scope may leverage other testing tools (e.g. ICE).

Quality Center has been in use at the NEACC since 2004 and houses a large amount of data, both current and historical, in the form of requirements, manual test plans and test sets, test execution results and defects. Though attempts have been undertaken to convert many of the core manual test plans to automated test script using Quick TestPro (currently Version 9.5), the majority of functional, integration, and regression testing continues to be performed manually using test manual test plans. In today's world, functional tests are executed by NASA Business Process Support (BPS) team members as well as by UNITEs Application Functional Support personnel. Specific aspects of testing, such as validating Funds Management and Special General Ledger postings, remain the responsibility of NASA's BPS team.

All of NEACC's Lines of Business have been incorporated into one large Production Project within QC, which houses all requirements, test plans, and test sets required to support all levels of testing for productive systems. A number of custom attributes have been added to various components of the project to facilitate reporting.

### Documentation Standards

As with Requirements Management, the NEACC has evolved the processes and procedures used for capturing and storing application design documentation. In earlier days, requirements and business rules were written in functional specifications, which were stored within Lotus Notes or some other repository. When RequisitePro was introduced to the NEACC, functional requirements were captured in the form of use cases, which marked and housed in RequisitePro. With the transition toward Agile processes, functional requirements are now typically captured in the form of user stories. Requirements are not marked within user stories. Instead, Agile teams, assisted by their supporting Business Analysts, create detailed test scripts to cover all requirements and business rules needed to support the user stories. The finalized test scripts become the enduring artifact that ensures requirements are understood and met.

#### **5.1.4 Solution Design**

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Solution Design consists of the processes and skills required to construct integrated solutions that satisfy business requirements within technical constraints. Currently, there is no separate team or group that performs the Solution Design function. Instead, this critical function—currently referred to as Solution Architect role—is typically performed by Senior Business Analysts from the Quality Assurance team or by Solution Architects from the Application Development area.

The Solution Architect has comprehensive understanding of software designs and solutions, combined with the skill and experience needed to help customers articulate their requirements. The Solution Architect typically creates the initial User Stories on which the software design is based, and they assist the team through its first iterations to continually refine their understanding of the customer requirements and zero in on the optimal solution.

The Solution Design role, although only recently defined as a separate function, has proven to be an extremely critical component of a successful software development effort.

### **5.1.5 Configuration Management**

Configuration Management consists of a set of processes and tools for identifying, controlling, maintaining, and verifying the versions of all configurable platform, system, and application components. Configuration Management represents a large area of opportunity within the NEACC. Currently, the NEACC does not maintain a central Configuration Management Database, nor does it have a set of common processes that define when and how changes to configurable items must be documented.

The goals of a disciplined Configuration Management approach include: providing greater visibility into the current state of all NEACC platforms, systems, and application assets, reducing the time and effort associated with item maintenance, and preventing unnecessary service disruption due to poorly understood environmental vulnerabilities. A well-run Configuration Management program is expected to result in performance and cost efficiencies as well as increased customer satisfaction.

## **5.2 Application Functional Support**

Application Functional Support (AFS) personnel play a critical role in supporting the business processes and applications offered to the customers of the NEACC. Unlike the other Delivery Function roles, AFS is both internal-facing as well as customer-facing. In order to provide both internal and customer-facing services effectively, the Contractor must ensure that skilled, knowledgeable AFS team members are available to support all NEACC Lines of Business. AFS personnel must retain a deep understanding of NASA business processes and customer requirements. Coupled with this knowledge of how NASA does business, the AFS team members must understand the inner workings and process flows of the applications within their Line of Business. Team members must demonstrate system expertise for any issue arising

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internal to their business processes; as well as the ability to research, test and draw educated conclusions about the cause of a particular issue.

AFS input is required for virtually every service performed by the NEACC factory. All incidents involving NEACC applications require an assessment by the AFS team to determine functional impacts and appropriate courses of action. Any contemplated change or enhancement to an application must start with a review by the AFS team to assess impacts and feasibility. The AFS team must be structured and staffed in a manner that provides for effective, seamless coverage across Lines of Business. The AFS team must work proactively to maintain all NEACC applications at an optimum working level, to anticipate customer needs, and to ensure that service levels are met.

AFS personnel must collaborate closely with the NASA BPS counterparts, and must understand and follow the processes outlined in Attachment **J-17**, *NEACC Process Guidelines*.

All members of the team are responsible for the following customer service tasks:

- Coordination with other Delivery Functions to ensure effective team work on providing customer support
- Ensure that software/system checkouts are performed following periodic hardware and application software maintenance are conducted
- Log service requests with I<sup>3</sup>P towers, third party vendors and/or other external sources as necessary to research application issues
- Monitor performance of all NEACC applications and take corrective action when degradation is observed
- Execute Incident and Problem Management processes to evaluate and resolve service requests, to include Master Data, Break-Fix, Enhancements, etc.
- Compile and deliver statistics to support Performance Measurement reporting
- Review and ensure Job Aids/End User Procedures are up to date and posted to Enterprise Performance Support System (EPSS)
- Evaluate and complete user submitted service requests, per Attachment **J-17**, *NEACC Process Guidelines*, consulting Business Process Support (BPS) team to ensure adherence to agency design
- Support end user forums to provide updates on recently implemented and planned changes to the super user community and center business process leads
- Maintain the application specific HELP function
- Keep current end user training materials
  - Hands on training
  - Web based training

All members of the team are responsible for the following development, testing and validation tasks:

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- Participate in solution design and requirements discussions
- Support execution of an effective Capacity Plan
- All team members are also responsible for the testing and validations of all changes to any code before it goes into production.
- All systems changes/updates whether enhancements, break fixes or change request are thoroughly tested and validated prior to being released into Production, according to the Attachment **J-17**, *NEACC Process Guidelines*
- Responsible for the creation and updating of the test plans used in testing.

### 5.3 Application Development

The NEACC depends on a staff of in-house application development resources, leveraging a broad range of programming and Software Engineering skills, to maintain the NEACC applications and supporting platforms at the required levels. Application development is a critical service offered by the NEACC and includes work in areas of Applications Maintenance, Applications Enhancement, and Applications Implementation.

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## Total Application Development Resources

Language / Platform	UNITeS FTEs
ABAP	
Web & ESB	
Business Analytics	

**5.3.1 Supported Languages and Platforms**

Supported programming languages and platforms include:

- Advanced Business Application Programming (ABAP): SAP's proprietary programming language
  - Classic ABAP
  - ABAP Object Oriented
  - SAP Workflow
- Web & ESB
  - Java
    - J2EE
    - JBI
  - Jco – A Java to SAP Connector
  - OSGi
  - Flex, BlazeDC, ActionScript
  - Ruby on Rails, JRuby
  - Pytho
  - Visual Basic
  - .NET
  - Web Services
  - XML, XSLT, XSD
  - Perl
- Business Intelligence
  - SAP Business Warehouse
  - Cognos
  - Actuate
  - Brio

**5.3.2 Software Engineering Practices**

Software Engineering practices leveraged by the Application Development teams include Agile Scrum and aspects of Extreme Programming (XP).

Application developers perform all activities required to deliver a functioning software component: understanding and validating requirements, designing and building components, executing thorough testing, recording and resolving defects, and packaging components into releases. The NEACC strongly encourages close collaboration between Application Developers



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and team members from other Delivery Function disciplines. Application Developers, for example, work hand in hand with Application Functional Support team members to understand and refine requirements and create and execute test scripts. Application Developers also work closely with members of the Integration Management team to ensure that processes are followed and to integrate delivered components into the overall Release Plan.

The NEACC also strongly encourages iterative development practices that provide the following key benefits:

- Commitment and focus of a cohesive, cross-functional team
- Frequent interaction with Application Functional Support team, users, and stakeholders to validate requirements and deliverables
- Continuous testing, with emphasis on automated testing, to ensure work quality throughout the development cycle

### 5.3.3 Web Application Development

Over the course of the NEACC's evolution, the industry trend in Business Applications has shifted gradually from Client/Server, Graphical User Interface(GUI) based systems to light-weight Web Applications that mimic the friendly look-and-feel of Internet Applications. In keeping with this shift, the NEACC has expanded its delivery capabilities in the areas of Web Application Design and Development and offers services comprised of the following general categories:

- Rich Internet Application (RIA) Development (Portlets or Standalone)
  - Web applications that behave like traditional desktop applications
  - Web enablement of traditional desktop functionality
  - Graphical Reporting Dashboards
- Composite Application Development (Portlets or Standalone)
  - Delivers a single access method to business processes that span multiple disparate applications
  - Simplifies complex processes
  - Simplifies security access/role management
- Mini-Application Development (Portlets or Standalone)
  - Serves up specific transactions or functionality from SAP or other complex UI systems
  - Simplifies complicated SAP functionality
  - Suited for casual SAP users
- Web Application Hosting

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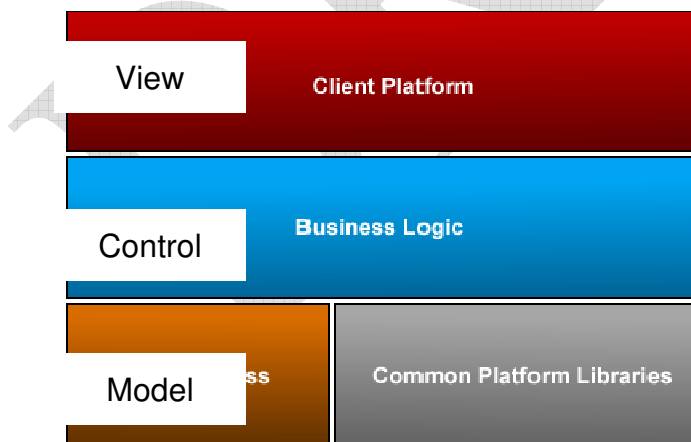
- Supports all open source platforms (Java, Ruby, PHP, Perl, Python, Flex, etc)
- Centralized migration/deployment toolset, administration, configuration
- Standardized application auditing/logging
- Common user authentication/authorization via NASA ED LDAP, eAuth

The following general principles guide the Web Application service delivery:

- Java Based Implementation (OS Isolation (JVM), Open Source Libraries, Work Pool)
- Open Standards (REST, J2EE Servlet/JSP)
- Open Source
- System Failure Isolation
- OSGi Compliance (Platform Independence, Service Isolation, Hot Deployment/Update, Transaction Visibility, Standards Based)
- Lightweight (Runs In Java Servlet Container (Tomcat))

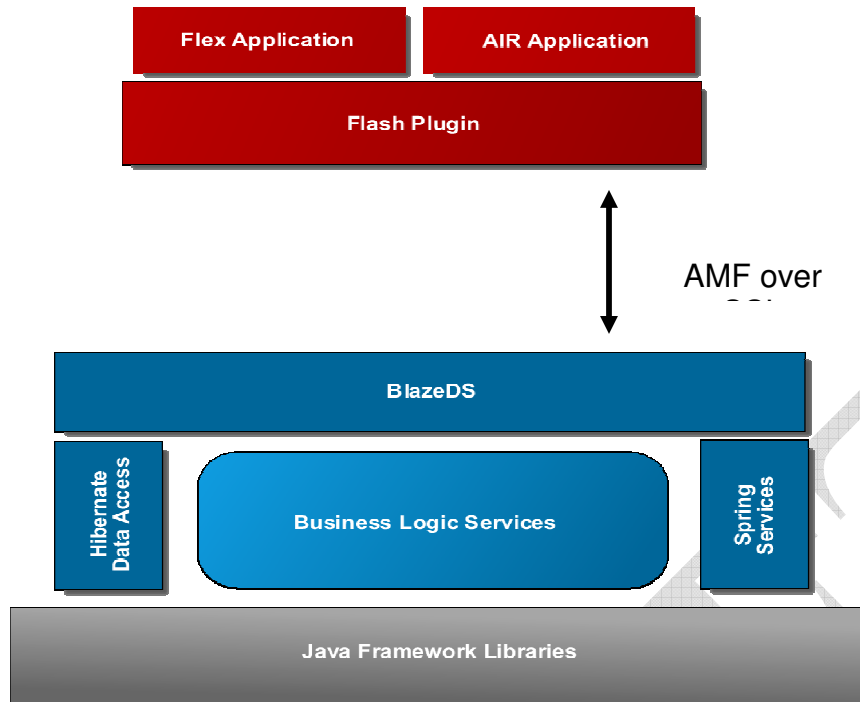
The following diagram depicts the Web Application logical layers, which are:

- Client Platform - Platform that the client Web Application runs on
- Business Logic - Contains all the business logic for the application, coordinates with the data access layer to retrieve and store information in the data store, and accesses the common platform libraries for executing reusable logic
- Data Access - Provides ORM (Object to Relational Mapping) access the backend data stores
- Common Platform Libraries – Contains the common reusable logic

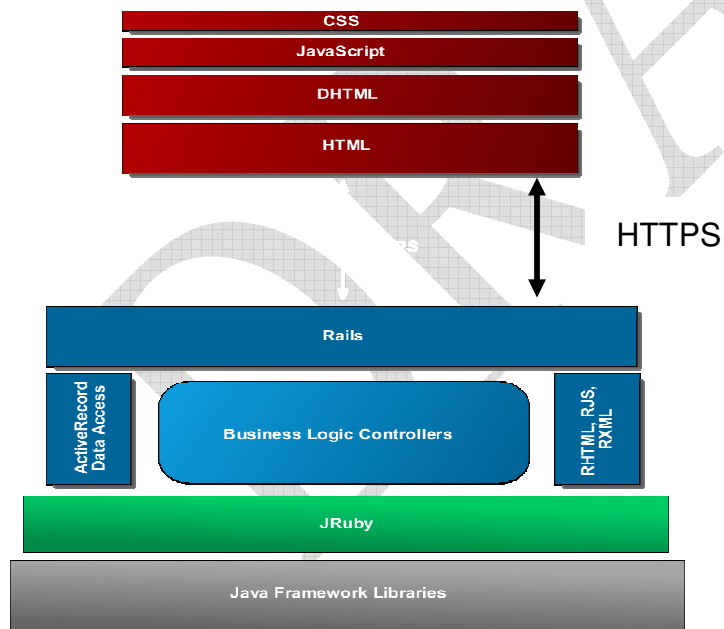


The following diagram depicts the interaction based Web application stack architecture:

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The following diagram depicts the content based web application stack architecture:



Examples of recently delivered Web Applications include the following:

- DSPL - an application used by NASA Logistics teams to execute the complex disposal process for NASA Government equipment

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- DSPL utilizes a custom-designed Oracle schema that resides within the SAP database
- DSPL interfaces with the federal Government Services Administration (GSA)
- N-PROP – NASA Property system available to all NASA and contractor personnel to view equipment inventories and assignments and to make minor updates to equipment profiles, such as location or ownership
  - N-PROP provides a friendly frontend to data and functionality that resides within the SAP system
  - N-PROP does not have its own data store, but rather interfaces back to the standard SAP data sources

### 5.3.4 Web and ESB Developer Skills

To successfully accomplish their work, developers leverage an ability to:

- Understand objected-oriented programming (encapsulation, polymorphism, data structures, etc.)
- Understand principles of thread programming
- Design and implement reusable framework libraries and components
- Gather, compile, and construct a presentable quality Interface Development Agreements and High Level Design documentation
- Develop integrated process utilizing the XSLT Engine
- Develop integrated process utilizing the Rules Engine
- Develop integrated process utilizing the Scripting Engine
- Design and implement enterprise level business service client interfaces (CIPS)
- Design and implement reusable business service objects (components / assemblies)
- Develop integrated process utilizing the SAP Inbound / Outbound Components
- Develop integrated process utilizing the DB Inbound / Outbound Components
- Develop integrated process utilizing the Rule Engine Component
- Develop integrated process utilizing the SQL Engine Component
- Develop integrated process utilizing the LDAP Inbound / Outbound Components
- Develop integrated process utilizing the BW Inbound / Outbound Components
- Design and implement enterprise level ETL integrations separating connection logic from the business logic
- Design and implement stand-alone web applications
- Design and implement platform independent Portlets

### 5.3.5 SAP Advanced Business Application Programming (ABAP)

Since the advent of the IEM Program, many NASA-specific enhancements and customizations have been incorporated into the standard SAP product suite. The following table provides a

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recent high-level view of the total number of custom ABAP objects. RICEF standards for: Reports, Interfaces, Conversions, Enhancements, and Forms.

Category	Current Count
Number of Reports:	146
Number of Interfaces:	39
Number of Conversions:	11
Number of Extensions:	72
Number of Forms:	24
TOTAL RICEF Objects:	292
Number of Report Painters:	53
Number of Others:	202
Number of Workflows:	36
Number of Objects from OSS Notes:	59
Number of Local Objects:	11
TOTAL Objects:	653

The standards and procedures utilized within the NEACC for SAP custom development have matured over the year. The NEACC has refrained from modifications to core code, instead leveraging customer exit or customer enhancement technologies. Where appropriate, developers make use of ABAP Object Oriented technologies and work to maximize component reuse.

The NEACC has not adopted SAP's Web-enabling technologies (ABAP Webdynpro, Java Webdynpro). Instead, the NEACC has chosen to use Open Source Web technologies, in particular Ruby and Ruby on Rails, to provide friendly front-end alternatives to underlying SAP transactions. These technologies are described in Section 5.3.3 of this document.

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**5.4 Applications Technical Operations & Maintenance (ATOM)**

ATOM represents a broad set of technical services that provide the underpinning for all work performed in PWS Section 3.0.

In this document, a “Platform” is a general-use solution that supports business process automation across multiple lines of business. Most typically, this solution would be comprised of a software implementation, COTS, open source, custom developed, or an integration of all three. Significant examples in the NEACC include, but are not limited to, the NEACC Business Intelligence solution and the application integration/data movement “Enterprise Service Bus”. Other examples would include general-use portal environments, software solutions that enable quality assurance testing and document management systems. Current operational platforms are more completely described in Attachment **L-B1**, *Background & Historical - Resource Baseline* section of this RFP.

“Systems” refer to the underlying network, computing, storage and security infrastructure that supports the various solution sets for NEACC lines of business. Historically, the NEACC has fielded and managed a large part of the infrastructure internally. The exception has been reliance on the external entity, the NASA Data Center, to provide facility “housing” for NEACC infrastructure. Also, the NEACC has relied on NISN to provision data center network and wide area network services. All other aspects of infrastructure design, acquisition, build and operations have been managed internally.

As other I<sup>3</sup>P towers are brought online, the NEACC will rely on other service entities to provision elements of infrastructure services. Most significantly, this will include NEACC consumption of computing, and storage services provisioned by the NASA Enterprise Data Center (NEDC).

The consumption of services traditionally managed internally by NEACC from outside entities will obviously require a transition. The degree and complexity of this transition will be a function of the timing and nature of NEDC service offerings. The following set of Statement of Work tasks should be viewed in that light.

At the completion of the NEDC contract phase-in period, the NEDC contractor will assume full operational responsibility for all NEACC computing storage infrastructures. The NEDC will also assume full operational responsibility for data center networking and business continuity infrastructure. Therefore, all NEACC computing hardware, computing operating systems, storage hardware, storage operating systems, associated support infrastructure and maintenance and licensing for all the aforementioned will be managed by the NEDC. The service unit between the NEACC and the NEDC will be: (1) Operating System Instance and (2) Storage by Tier by Terabyte. A summary of the computing and storage infrastructure is included in

## Attachment L-B - Background and Historical

Attachment **L-B1**, *Background & Historical - Resource Baseline*. More detailed architectural views by NEACC Line of Business will also be made available.

		EAST Application Support (DABO)	NEDC Linux/Windows/UNIX/Storage Ops
<b>Design</b>	Solution design System requirements definition New technology integration EA awareness Formal work product	Application	
<b>Acquire</b>	Develop ROM estimates Manage the acquisition of services and products from vendors and service providers License management	Application	
<b>Build</b>	Execute hands-on build and testing for new and existing configuration	Application	System (C/S and Storage O/S and below)
<b>Operate</b>	Monitor	Application	System (C/S and Storage O/S and below)
	Event	Application	System (C/S and Storage O/S and below)
	Business Continuity Design, Testing and Operations	Application	System (C/S and Storage O/S and below)
	Performance Mgmt	Application	System (C/S and Storage O/S and below)
	Configuration Mgmt	Application	System (C/S and Storage O/S and below)
	Maintenance (upgrades, patches)	Application	System (C/S and Storage O/S and below)

- Design
  - System requirements management
  - New technology integration (insertion of new technology)
  - Awareness of NASA Enterprise Architecture
  - Awareness of NEACC Enterprise Architecture
  - Formal work product creation, review and maintenance
- Acquire
  - Development of Rough order of magnitude cost estimates
  - Development of acquisition strategy options and recommendations
  - Development of purchase requests and associated documentation
  - Support the procuring organization
- Build
  - Execute hands-on system builds
  - Execute integrated testing of system components within the NEACC testing strategy and tool-sets
  - Manage and ensure transition to operations for all technology elements

## Attachment L-B - Background and Historical

- Operate
  - Event Management
  - Problem Management
  - System Monitoring
  - Configuration Management
  - System Maintenance (patches, upgrades, enhancements)
  - Performance Management

**NEACC Systems Summary**

The NEACC makes extensive use of Sun computing equipment and Sun's Solaris UNIX operating system. The most significant database services are run on three domainable "E" class Sun enterprise servers. The NEACC depends on several Sun M5000's, which are also domainable. Most Solaris instances in the NEACC execute Version 10 of Solaris. Refer to Attachment **L-B1**, *Background & Historical - Resource Baseline* for server O/S counts. The NEACC has, mostly, acquired Platinum maintenance from Sun for enclosures that support Production environments. Non-Production servers have "Gold" hardware maintenance levels.

The NEACC also has a significant footprint of servers running the Microsoft Windows Operating System. These include Windows 2003 server and 2003 Enterprise (clustered servers). Maintenance is uplifted via Microsoft for 2 hours start work on all Production and non-Production systems. The Windows O/S's run on Dell and IBM hardware and Intel-based Sun (Intel) for Windows. There is a mixture of dual and quad-core processor configurations. This equipment ranges from 4 years old to new. The primary Windows platforms support ESB, Web Applications, SQL Server, Primavera, QA tools, and Portals.

The NEACC depends on ESX VMware to provision virtualized Windows and Linux O/S instances. ESX runs on both IBM and Sun quad core quad processor enterprise class servers. The current version of is ESX 3.5. The O/S's host a variety of applications and services. Each enclosure averages 10 to 12 Windows or Linux instances. There is a legacy NDC VMware platform used for Citrix. The total count of virtualized environments is 150 o/s instances.

The NEACC makes extensive use of the Linux operating system. Linux is used for Web Apps and other requirements. Linux is also used for WebTADS and for all of the Web App / Service Oriented Architecture (SOA) tier. All of Linux used in the NEACC is virtualized. There are several versions and Linux in use. The count is roughly 50 instances.

The NEACC primarily uses EMC for storage. The NEACC uses DM class machines and a small Clarion footprint. Storage and data classification includes 4 tiers. Total storage usage is roughly 200 Terabyte. The NEACC makes extensive applications operations use of EMC's Business



## Attachment L-B - Background and Historical

Continuity Volume (BCV) capability. There is also extensive use of point in time recovery to enable quick copy and instance refresh.

The NEACC depends on the NISN Data Center Network Service to manage all network activities. The NEACC uses a dedicated private and public network. It is intended to be merged with the NDC private and public network. DCNSS manages the security perimeter (firewall and VPN) for NEACC network access.

The NEACC primarily utilizes Oracle as a DBMS platform. This is covered under the Agency license.

The NEACC primarily relies on tape backup for business continuity protection. Production is backed incrementally nightly and full on weekends. These tapes are vaulted on the MSFC campus. The NEACC currently depends on MSFC NDC ops for tape operations and vaulting. The NEACC has a contract with SunGard for a six week presence at the SunGard facility in the event of a disaster. A list of key business processes are tested yearly at a SunGard facility. The NEACC resource baseline, Attachment **L-B1**, *Background & Historical - Resource Baseline*, includes T10000 tape machines and 9940 tape devices (tapes and tape heads). These were purchased by the NEACC. The nature of the NEACC use of tape systems under the EAST contract will be a function of NEDC service offerings and transition plan.

**Application Operations and Maintenance Team**

The Application Operations and Maintenance (AOM) group is an organization within ATOM that was created to support all NEACC applications from a technical and operational perspective. The AOM group handles all Applications Operational support to ensure that NEACC's mission is accomplished and to coordinates activities with outside vendors as needed.

One primary area of responsibility for the AOM team is to ensure that the integrity of any Test or Production environment is maintained. Based on Segregation of Duties (SOD) that NASA has defined, AOM is responsible for making application changes as specified in approved service requests. (AOM uses a custom Lotus Notes application For approval and tracking of SAP code migrations. This tool has been used since the initial Core Financial implementation.) Once migrations/transport are made to the Test environments, AOM is responsible for supporting all testing activities. When issues arise, AOM often takes the lead to resolve the issues from a technical perspective.

The AOM team also monitors test jobs and production jobs based on the current event handling module employed by the NEACC. Once testing is complete and all approvals have been given, AOM moves the migration/transport package to the next environment in the life cycle testing migration path as defined by Release Management (RM). AOM is also responsible for making any approved configuration changes to any application environment other than Development.

## Attachment L-B - Background and Historical

When the Architect/ Engineer team gets approval from NASA, AOM is responsible for executing application upgrades or patches for the applications supported. AOM works with the Architect/Engineer teams to make sure that the scheduled tasks can be accomplished in a timely manner and with cross-team coordination. The AOM team works with user-facing applications, as well as with tools that the user may not know are active in the background. One example is the Enterprise Scheduler. AOM schedules most of the jobs outside of SAP utilizing the Enterprise Scheduler, and they are responsible for setting up all jobs in a distributed system. This work entails creating, testing, executing and retiring all enterprise jobs related to this distributed environment. Another area of involvement for the AOM team is in the creation of load or test scripts using WinRunner.

The goal of the AOM team is to remain invisible to the end-user, while providing support for all technical activities required to ensure continued, smooth operation of applications and end-user processes.

Environment Responsibilities

1. Locking down of any environment (other than Development) with access permission only for the AOM team
2. Installation and Configurations of any applications outside of SAP in any application environment
3. Migrations occur out of Development to Test environments by AOM personnel only
4. Migrations occur out of Test to Production environments by AOM personnel only
5. Migrations occur out of Production to any other environment by AOM personnel only
6. Any modifications to Test/Production environments related to the applications are done by AOM personnel only
7. All modifications to Test/Production environments related to the applications are driven by the Remedy system through approved SR assigned to AOM
8. All activities in Production occur with an Activity Request in the Remedy system, which must be logged at least a week in advance of the activity
9. Work with other areas to build Test/Production environments for applications

Upgrades/Maintenance Applications Responsibilities

1. Upgrades to the applications are handled by the AOM team and based on approval of the Architect team
2. Patch Management for COTs applications – fixes from application vendors
3. Analysis for applications changes
4. Assist Applications Development and Release Management with release planning
5. Any application related infrastructure changes will be worked and coordinated with the AOM team
6. Setup and execution of all Batch jobs for any applications

## Attachment L-B - Background and Historical

Operations Responsibilities

1. Change Management for each application (Process may be different for each application, but procedure will use service request system)
2. Create reports and communicate them to the appropriate groups
3. Document all application processes and procedures
4. Monitor all applications outside of SAP for testing (8/5) and Production (24/7)
5. Any application issue is sent to the AOM team through the Remedy system. For emergency issues, the AOM on-call phone is called.
6. Any issues that occur to the environment that the applications resides are reviewed by the AOM team before it is closed
7. Plan and execute rollout of new application operations services
8. Work with third party suppliers and vendors related to the applications supported by AOM
9. Conduct performance reviews with third-party; drives action plans
10. Monitor changes and updates to all AOM-supported application documentation
11. Manage and own the issue lifecycle
12. Manage application security according to security policies
13. Review and approve middleware administration procedures
14. Review and execute any SQL requested by application owners

The following is a listing of some generic support procedures that the AOM team manages for each NEACC application:

Production Support

- Migrate code fixes
- Work incidents (trouble tickets) and manage all activities through incident resolution
- Work Change Requests and manage all activities through request resolution
- Support Functional Testing

Testing Support

- Migrate code fixes
- Support Testing of code fixes

General Support

- Work assessments on incidents and requests related to all applications
- Work with Architects to implement upgrades or significant changes to infrastructure
- Support meetings related to upgrades and enhancements for Production systems
- Generic support for system integration testing for all releases
- Maintain documentation related to AOM processes and procedures
- Development of reports for applications
- Develop SQL to operationally support applications

## Attachment L-B - Background and Historical

- Input to bi-monthly communication with the NEACC related to BMC ControlM
- UNIX Script Development and Testing(minor)
- UNIX Script Support
- Weekend support from a technical perspective
- Support patching of all Servers
- Communicate with NASA Functional leads
- Monitor ALL (Testing and Production) ESB
- Monitor ALL ( Testing and Production) BMC System Jobs for NEACC
- Handle Technical Year End processing

**General Application Modifications/Migrations done by AOM:**Production:

AOM adheres to documented procedures when making changes in the Production environment for any NEACC application. Examples of possible changes are updates to configuration files, code files, BMC jobs or database modifications. All Production changes are requested through the Remedy systems and approved by NEACC management.

Production support changes are worked in normal business hours, 8 AM to 5 PM Central Time on weekdays, whenever possible. The normal migration window for production is Thursday night between the hours of 7 PM and 9 PM. Additional support for emergency requests is provided. AOM monitors systems 24/7 and addresses any incidents that arise.

Test:

Test environments include but are not limited to TST, QA1, QA2, TRN, DEV2, RT1, YE0 and CN1. Changes to test environments are generally handled following similar procedures to those used for Production, in that a configuration file, BMC job or database modification to anything related to Test must be approved by NEACC management. All Test changes are requested through the Remedy system.

Test Environment support is provided during normal business hours, 8 AM to 5 PM Central Time on weekdays.

**After-Hours Requests:**Production:

Requests that occur after normal business hours are handled through the AOM On-Call cell phone. The On-Call assignee either works the incident or directs the request to the appropriate AOM resource. If the incident is significant, the AOM On-Call person notifies the AOM lead.

Test:

## Attachment L-B - Background and Historical

Requests related to Test environments are not handled outside of normal business hours without prior notice. If prior notice is provided, support can be given to requesting organization. Prior notice generally occurs at least two days before the requirement is needed.

**Entering Activity Requests:**Production:

Activity Requests are approved by the AOM lead and are entered into Remedy as soon as possible with AOM as the requestor. Activity Requests are made as far in advance as possible.

Test:

Activity Requests are not normally required. If they are needed, the same procedures as those used for Production are followed.

**5.5 Information Assurance**

Within the governance, risk and compliance work area there are several overarching elements that ensure that the security program maintains a level of adherence to standards and regulations, as well as oversight through an internal auditing process. These activities include security plan management that governs the continuous monitoring of over 200 security controls; audit and internal audit support which conduct routine assessments of the adherence to security controls, standard operating procedures and work instructions; compliance reviews which conduct routine reviews of evolving guidance and their impacts on the overall NEACC security program; training and awareness which enhances the Agency security awareness with real-time, relevant security considerations for the NEACC.

One of the most important aspects of any security program is to manage change. Change to the personnel, change to the infrastructure, and change to service offerings all entail a key aspect of security through which we are challenged to ensure that the security program is ever vigilant and changing within itself. The security program must maintain a clear lifecycle management approach through which elements of change are supported with the proper security controls and improvements. The security program should clearly describe how change would be managed through various aspects of IT Management:

- Policy
  - Maintain awareness of current and emerging NASA IT security policies and directives
  - Develop and maintain applicable security planning work products
- Identity

## Attachment L-B - Background and Historical

- Managed a consolidated, centralized account management capability within the NASA ICAM tool-set
- Security
  - Manage a business continuity program for the NEACC
- Audit
  - Support NEACC Audits

**Access Management**

The NEACC provides a level of access management into our systems/applications that includes several key elements – Authorization Management, User Management, as well as management of system/application controls. Additionally, through the oversight of a distributed access management workforce, the NEACC manages the entire lifecycle of user access management for the entire Agency.

**Access Management Team**

- Daily Responsibilities
  - Provide Account Administration support for the NEACC and 10 NASA centers
  - Provide De-Centralized Account Administration Management to all Center Security Administrators (CSA) covering 10 NASA Centers
  - Prepare and coordinate CSA access training for all new applications and new CSAs
  - Organize and support the Center Business Process Lead (CBPL)/ CSA summit
  - Address Security Inbox SAP Security related emails
  - Analyze service requests (SRs), Defects and Errors identified during testing
  - Analyzing and correcting complex SAP Security Issues
  - Support NASA as the Agency SAP Security Administrator including creation and maintenance of SAP roles and users, including Business Warehouse
  - Perform analysis and coordinate issue resolution in support of NASA audits
  - Assess user access needs and resolve issues quickly
  - Provide on-call support for response to critical issues
  - Create and maintain custom authorization objects, program groups, and table groups to meet specific business requirements
  - Create and maintain developer access, developer keys and user accounts in SAP Online Support System (OSS)
  - Administer user master data including user accounts, groups, Parameter Identifiers (PIDs), and licensing
  - Perform trace analysis, troubleshooting, and resolution of SAP authorization issues

## Attachment L-B - Background and Historical

- Utilize SAP and third-party scripting tools to automate and maintain users, create test accounts and scripts, and perform user and role administration
- Support application development projects
- Support System Integration Test (SIT) cycles and work related defects
- Review Service Requests for impacts to system account access
- Submit/monitor SRs to enhance NAMS Workflows
- Test SRs being completed in NAMS
- Review/complete NAMS requests for NEACC applications
- Assist NEACC users with submitting and tracking NAMS requests
- Provide guidance to application owners in the development of NAMS for their application
- Perform Account maintenance for existing IEMP application accounts
- Weekly Responsibilities
  - Chair weekly CSA Teleconference
  - Update Access Management Milestones in NASA Integrated Information Reporter (NIIR)
  - Provide Support to the Review Release Board (RRB)
  - Monitoring the Sensitive Roles Report every 2 weeks
  - Conduct Post processing after system refreshes
  - 24/7 on call security support
- Monthly Responsibilities
  - Reset all system passwords in the SAP/BW landscape every 60 days
- Annual Responsibilities
  - Support Access Management Document Review (30 documents)
  - Support NEACC Audit
  - Support NASA Fiscal Year-End activities
  - Support Access Management NASA site audit

## Security Architecture

- Perform application security analysis
- Attend scrum meetings
- Facilitate security involvement within application development projects
- Review project requirements
- Organize meetings with the appropriate stakeholders
- Apply the Security Development Life Cycle (SDLC) to all projects
- Ensure project deliverables are met within the project timeline
- Review High Level Design Documents for clarity and security controls

## Attachment L-B - Background and Historical

- Review Architecture Designs
- Security Manager alert review
- Update NIIR
- Provide status reports on all security requirements
- Perform Positive and Negative testing on all security roles

## Governance, Risk &amp; Compliance

- Daily & Weekly Responsibilities
  - Security patch monitoring
  - Security Controls gap analysis
  - Corrective Action Plan (CAP) guidance
  - Security control advisement
  - Review NASA Automated Systems Incident Response Capability (NASIRC) events
  - Review daily reports from IT Security
  - Review IntelliShield alerts
  - Incident Handling
  - Firewall Service Request (SR) Review
  - Assign each application to a security plan and eliminate the duplicates
  - Review security plans
  - Review Plan of Action and Milestones (POA&Ms) listed in IT Security Center (ITSC)
  - Prioritize POA&Ms based on their due dates, impact, and complexity
- Monthly Responsibilities
  - Review the Internal Audit process for NEACC
  - Perform quarterly audits against build documents on all systems and databases
  - Perform quarterly audit of the NEACC vault, firewall rules, lab access and privileged accounts.
  - Assist the System Administrators with the quarterly scan reviews
  - Maintain up to date list of National Institute of Standards and Technology (NIST), Office of Management and Budget (OMB), NASA Procedural Requirements (NPR) documentation
  - Security Awareness training
  - Review security scan reports
  - Review patch plans
- Annual Responsibilities
  - Internal Audit support and coordination
  - Security Plan updates, new revisions



## Attachment L-B - Background and Historical

- Certification and Accreditation (C&A) process
- Audit support
- Quarterly Engineering test
- Quarterly Vulnerability Scans
- Pen Test Support
- Configuration check of the server being audited
- Review server build checklist
- Review Virtual Private Network (VPN) accounts
- Firewall Rule review

**Business Continuity**

The NEACC has a very mature business resiliency program based on best practices, as well as NASA and Federal Guidelines. Within the business resiliency program the NEACC maintains four key plans – Disaster Recovery (DR) Plan, Contingency Plan, Cyber Incident Response Plan and Business Continuity Plan. Through these plans and their subsequent testing, the NEACC assures that the systems and the business of the NEACC are aligned with the business impact assessments of the consumers of those services. The disaster recovery plan describes numerous aspects of the recovery of the systems/applications as they relate to a catastrophic outage that may occur and last longer than 72 hours.

The Contingency Plan describes numerous aspects of the recovery process and teams required for the systems/applications that may be required for an outage that may last between 4 and 96 hours.

The Cyber Incident Response Plan describes the processes, as well as the roles and responsibilities of the personnel in case a security incident is realized on one of the NEACC systems/applications.

The Business Continuity Plan describes the critical resources and procedures that would be required in case the NEACC cannot operate in a normal capacity. Each of these key plans is tested at least annually in one of three methods – Exercise, TableTop, or Review. These methods help to ensure that the plans maintain a high level of accuracy and continuous improvement.

**Business Continuity Team**

- Daily & Weekly Responsibilities
  - Ensure that disaster recovery hardware matches NEACCs production environment and business recovery time objectives
  - Ensure that all new applications are added to DR plan
  - Ensure that all applications being decommissioned are removed from DR Plan tabletop exercises, contingency exercises and SunGard DR drills
  - Make appropriate updates to all DR and Contingency plan documents

## Attachment L-B - Background and Historical

- Ensure POA&Ms, CAPs and DR action items are completed within timeline
- Research industry best practices for DR and make recommendations
- Monthly Responsibilities
  - Ensure that disaster recovery hardware matches NEACC production environment and business recovery time objectives Ensure that all new applications are added to DR plan
  - Ensure that all applications being decommissioned are removed from DR Plan upcoming tabletop exercises, contingency exercises and SunGard DR drills
  - Make appropriate updates to all DR and Contingency plan documents
  - Meet with NEACC management to review Emergency preparedness project plans
- Annual Responsibilities
  - Facilitate tabletop exercises and report results
  - Facilitate SunGard DR drills and report results
  - Facilitate Contingency drills and report results
  - Prepare documentation for auditors
  - Research and recommend new recovery strategies
  - Conduct business impact analysis to ensure that NEACC recovery strategy meets NASA recovery requirements

## 5.6 I<sup>3</sup>P Cross Functional Integration

Not applicable in the current environment. Refer to Attachment **J-1** PWS, *Section 2.6* for details on I<sup>3</sup>P Integration requirements under the EAST contract.